BOOK OF ABSTRACTS

MutaMorphosis: Challenging Arts and Sciences

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http://mutamorphosis.org

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*The members of the Steering Committee --- **Alban Asselin, Louis Bec, Annick Bureaud, Don Foresta, Denisa Kera, Roger F. Malina** (co-chair), **Louise Poissant, Pavel Sedlák** (co-chair), and **Pavel Smetana** --- would like to thank all the members of the Honorary Panel --- **Rudolf Arnheim, Herbert Franke, Ivan M. Havel, Vera Molnar, Frank Popper, Sonya Rapoport, Jasia Reichardt, Itsuo Sakane, Sonia Sheridan, Steina, Woody Vasulka** --- as well as all the members of the Advisory Committee --- **Lorella Abenavoli, Marc Battier, Nina Czegledy, Ricardo Dal Farra, Alain Depocas, Hans Diebner, Michele Emmer, Machiko Kusahara, Lubica Lacinova, Michael Punt, and Nicolas Reeves** --- for all the efforts towards the success of the MutaMorphosis conference.*

Introduction

Bec, Louis
We Are Extremophiles

We are all extremophiles. /1/

Life is undergoing tension.
Life is undergoing pressure.
Life is undergoing depression.
Life is undergoing transgression.

The biomass is being shaken, destabilised...

How shall we respond to the urgent questions regarding survival and meaningfulness...
How shall we elaborate new strategies for inventive adaptation in order to persist, faced as we are with the degradation of the conditions of life and our environments, which are becoming progressively more toxic – and sometimes even deadly.

We are all extremophiles who **possess** the memory of the origin of life.

Life developed in an unwelcoming world, bringing with it a long-lasting transformation of the environment through the creation of an atmosphere. /2/
Life has invented various strategies in order to leave the oceans and occupy the ensemble of ecosystems and the greatest possible number of ecological niches.
We are therefore accountable for this 'living whole' – not only because we are part of it, but because of our growing awareness that it is becoming fragile, falling apart and undergoing dramatic amputations as a result of the planet's 'ecosystemic turbulences'.

We are extremophiles **immersed** in a labyrinth of prejudicial aggressions.
The multiple forms of pollution, starting with global warming, are gradually destabilising our environments in which we have engaged in the ensemble of humanising processes by profoundly modifying them and thus arriving at our present civilisations and 'highly evolved' cultures. We are conscious of the impact they have had and will continue to have in the future on the distribution of wealth, on the growth of sanitary inequality, on the inevitable energy crisis and on the proliferation of humanitarian catastrophes. /3/

As extremophiles, we know how to calculate the dangers of convergent migratory flows towards opulent substrata, provoking conflictive attitudes, uncontrollable repressive countermeasures, instances of extermination and even genocide as a result of disaffection.

Gilles Clément, /4/ the author of 'Planetary Garden' /5/ analyses the causes of this situation and comes to his own objective conclusions. In his 'Third Landscape Manifesto', he advances the idea that the present-day practices of planetary exploitation correspond on a massive scale to a liberal-style market economy with immediate profit motives. The risks are great and evident: environmental worries addressed in the end through fear, marketing or different forms of profit inspired either by politics or commerce.

We are **predatory** extremophiles.

We acquire, in an imperialist way, territories, riches, cultures, energies and vital raw materials to satisfy our own needs.

Most often, every time we try to colonise inhabited areas 'pacifically', we unleash hostility in those milieux and bring systematic ruin to the natural, cultural and patrimonial environment 'through collateral damage'.

Moreover – to take the example of the thousands of women and children in Mailuu-Suu searching for welded nickel in light-bulb shells in dumps of a factory located on terrain where uranium was previously mined – there are **prototypical** extremophiles among us, trying to survive in a maximally toxic and radioactive environment where the atmosphere is laden with a surplus of glass powder, to boot.

Are we unaware to that extent of the new larval slavery we are provoking and the resulting silent degradation of the planet's biodiversity?

But we are also **creative** extremophiles.

We obey behavioural attitudes which are proper to the specific characteristics of living species. We are obsessed with discovering and surveying unknown environments, with the vertigo produced by limitless expanses, willing to explore outer space and ready to set out and conquer infinitesimal nanometric worlds.

We are haunted by exploratory tropisms, by the irresistible attraction for aggressive biomes, for vague and dangerous zones.

We are inhabited by the inclination to exceed or overturn 'taboos', limits and frontiers. We thus shamelessly undermine the very logic of life by installing factories for producing organisms by means of biotechnology and transgenetics, expecting to improve our adaptive capabilities and prolong our life expectancy.

We are also being tormented by the bulimic greed for immoderately accumulating knowledge.

We are determined to take up all challenges with a blind faith in our overpowering technology, which 'humanises' us every day.

We are collectively bewitched by the quest for constraints, for obstacles to be surmounted, by a provocative syndrome which presses towards systematic experimentation.

We are also obsessed with a curious idiosyncrasy – 'that of creating utopian worlds' /6/ by the proliferation and variety of scientific activities and artistic and technological forms of expression. Having been freed from the caves, we must go beyond the limits of imaginary and symbolic universes to construct our 'cultural' and fantastical 'reservation'.

As a result of a long heritage of neural evolution, we are **thinking** extremophiles.

We have equipped ourselves with an efficient cognitive tool which has evolved and become more and more complex with the millennia – to the point that the brain itself has become not only a new space to explore, in all its strangeness, with all its unfathomable potential the concomitant responsibility, but also the guarantee of our survival and of that of the planet, which depends in a fundamental way on the better cognitive and predictive understanding of a future which appears uncertain.

Cognition has become an extreme milieu which we have been exploring since the night of time, of animal and artificial intelligence. Thinking with the brain about the brain is an incredible recursive feat which requires sophisticated digital methods for image exploration that might allow us to see ourselves thinking.

For many, scientific progress and technological advances have become suspicious and combine to amplify the breathless phantasmagoria, showing all the signs of a latent catastrophe which the industries of 'the imagination' speculate with and amplify in the media, vulgarising heroic conduct by feeding gregarious fears.

We are extremophiles who share neither the pessimism of those who find themselves overwhelmed and resigned, nor the blind optimism of those who believe scientific and technological devices will overcome the ensemble of problems we are confronted with.

We are conscious and engaged extremophiles; we are working towards the emergence of a **cultural and anthropological paradigm**. Even if the scheme presented above and our ill-adapted mentalities prevent us from understanding the vast scale of the phenomena we are faced with today and the exact degree of the seriousness of their impact and their interdependence.

The symptoms of this paradigm are also expressed through the growing role being played by the **transgressions** and **mutations** they generate.

The transgressions systematically impose control measures and prohibitions, favouring an authoritarian hardening of liberties, basing itself on notions of equilibrium and principles of long-term 'responsibilities', /7/ because it is convenient to anticipate the eventually destructive consequences of the ensemble of our activities in order to bequeath a still inhabitable world to future generations.

New ethical questions are arising at the core of our societies.

But if this is the case, what kind of ethics are we dealing with? It will probably be necessary to go beyond previous Biblical and philosophical moralities, which no longer seem operable. It will be necessary to explore new types of evolutionary ethics more in tune with the 'nature itself' of the problems to be resolved.

If moral systems /8/ are, in fact, the result of natural selection aiming at the improvement of the aptitudes and descendants of both individuals and groups and at evolving in unstable and alterable environments, new concepts, new activities and new practices must clearly be called upon.

What are the limits to where we might go to defend the rights of future generations without, at the same time, putting democracy in danger?

What place shall be reserved for the counterbalances of information and artistic expressions?

The conference titled **'Mutamorphosis'** is part of a general event whose objective is to question the major mutations that weigh on the future of our word, on the evolution of humankind and of societies and consequently on its modes of scientific and technological knowledge, its artistic expressions and its forms of communication.

In this sense, it must set itself apart from the objectives pursued by the run of conferences devoted to the relationships between the Arts and the Sciences where sterile and 'mundane' repetitions content themselves with a fuzzy interdisciplinarity.

'Mutamorphosis' should make it possible to install new configurations throughout the close link between ethical, epistemological, aesthetic and ecosystemic conditions.

It should base itself on the presence of two important phenomena that have spanned the last few decades: the acknowledgement of dangers and risks and the fundamental need to put in place methods for predictability by modelling phenomena associated with the handling of their global and local effects.

It should show proof that the necessary plurality of scientific, technological and artistic disciplines may combine effectively through their specific interactions; that this transdisciplinarity represents a real, feasible opportunity with political consequences; that it can participate in the inevitable geo-cultural, geo-political, economic and social reconfigurations to come.

The resulting studies will provide the 'operators' for deciphering our world. They will enable us to describe, analyse and model it with predictive aims in mind.

The task of the inventive experimentation, visionary and anticipatory and symbolic activities involved will be to enrich the force of the future symbolic and fantastical dimensions of the 21st century.

They will contribute to the advent of a real cultural policy – that of a new equilibrium between life, humankind, the different fields of knowledge, modes of expression and technological developments we have mastered.

We must properly weight the shifts that will take place. Thus, with regard to artistic practices, it will be necessary to abandon the present wanderings arising from market forces and 'star' production in order to elaborate cognitive tools and contribute to the emergence of aesthetic epistemologies.

By thus confronting the issues that are of essence, **'Mutamorphosis'** situates itself at the heart of the concerns of our time, as both observer and actor in a real paradigmatic shift.

'Mutamorphosis' will constitute an X-ray of the situation resulting from the multiplication of viewpoints, of the quality and the diversity of the participants – specialists, researchers, artists, philosophers and engineers – as well as the relevance of the themes that will be dealt with.

If ecologists have built their project on a morality of repair work, the moment has come to build a project based on a dynamic of transformation, giving the floor to all the agents of the imagination – scientists, creators, artists, etc. – as the true advocates of a planetary mobilisation.

We extremophiles are profoundly happy to be in **Prague**. **Franz Kafka** /9/ is at our side. **Vilém Flusser** /10/ is not far.

Prague is the city where the author of **The Metamorphosis** showed that the exploration of hostile environments was possible only at the cost of undergoing a profound physiological and behavioural mutation.

The ethological study of the behaviour of Gregor Samsa, transformed into a 'monstrous insect' reveals to us to what extent 'man/insect' hybridisations are complex and entangled.

Kafka's vision of the evolution of societies and the critical positions he advanced as a precursor of contemporary dystopias show us that normative forcings and conditionings always aberrant engender morphogenetic leaps and deviant metamorphoses.

Kafka raised this inevitable issue, which opens onto a new order of relationships between humans and their environment and is relevant to our future: the 'animal metamorphosis' going the contrary direction, the eternal return to animal nature.

Vilém Flusser was forced into exile in Sao Paolo for 33 years. He was forced to flee from Nazism, 'the still fertile womb which produced the foul beast'. /11/

When he returned to Europe, he settled in France. Several years later, he imagined an epistemological and satirical evolutionary future in the form of a cephalopod called **Vampyrotheutis Infernalis** which lived in the extreme environment of the ocean depths. He was particularly interested in a curious adaptive capacity manifested by the organism: it was able to think of the events that take place in the world using its own intestines. /12/

We extremophiles continue to pursue these permanent exploration processes which have been taking place for three billion years, based on the principles of the permanence of life, through its robust character and is proliferation.

References:

/1/ An organism is said to be extremophile when its normal living conditions are lethal for most other organisms: temperatures approaching or above 100° C (hyperthermophiles) or below 0 °C (psychrophiles), extreme pressures (the ocean depths), environments heavily laden with salt halophiles, acidic or alkaline environments, radioactive environments and environments lacking in oxygen ... Many extremophiles belong to the taxon of the Archaea or of Bacteria, although there are also single-celled Eukaryote and Metazoan extremophiles (insects, crustaceans, fish …). The term is reserved, however, for single-celled organisms.
Extremophile organisms can be found around hot sulphur springs, underwater hydrothermal vents, sediments, in the Antarctic ice, in salt-saturated water (the Dead Sea), in oil deposits…
Some living beings, called polyextremophiles, even combine several resistances (for example Deinococcus radiodurans, Kineococcus radiotolerans , or Sulpholobus acidocaldarius).
Though they are perfectly adapted to very special conditions, extremophiles are rare under more ordinary conditions. In fact, even when they are able to withstand such conditions (because in certain cases their metabolism requires extreme conditions), they are ill-suited to deal with the competition of commonplace organisms. One may distinguish between extremophilia and extremotolerance, depending on whether an organism requires exceptional conditions or tolerates them but is found under more ordinary conditions.
We must distinguish between extremophiles, who normally live under extreme conditions, and organisms capable of taking on forms that are resistant to unfavourable conditions (by suspending their vital functions or by creating protective cysts or spores).
/2/ In the primordial atmosphere, oxygen did not exist in the pure state. It was bound to hydrogen in the water molecule (H_2O). Only a strong chemical reaction could separate

them. Three billion years ago, a miniscule blue algae capable of photosynthesis appeared. The proliferation of the algae set free enormous quantities of oxygen (O_2), which oxidised all the toxic substances within reach before accumulating in the atmosphere. Higher still, it was able to take on another atom by reacting with ultraviolet rays (O_3). Thus the ozone layer was formed, and life was able to leave the oceans.

/3/ Darfur: The bloody war that has afflicted the three states of Darfur in western Sudan since 2003 has provoked one of the most serious humanitarian catastrophes of the new century: 110,000 refugees in Chad, 700,000 people displaced in the interior of the country and more than 10,000 deaths. Witnesses all recount the same scenes of desolation and plundering: attacks at dawn, burnt villages, roads made impassable, stolen herds of livestock and districts rendered off limits to humanitarian organisations and foreigners. In a matter of months, the tribal conflicts that governed life in Darfur for twenty years were transformed into a bloody civil war.

/4/ Gilles Clément 'Manifeste du tiers paysage' (Third Landscape Manifesto) An horticultural engineer by profession and a teacher at the École nationale du paysage de Versailles (Versailles National School of Landscape Architecture), he developed the 'planetary garden' theory and the concept of the garden in motion. The practice is based on the observation that a landscape is not fixed. Instead of confining plants in a particular spot in order to organise a project, the planting 'redraws' the garden constantly in such a way that the garden today will not be the same, in that same place the next flowering period. It is thus favourable to the interbreeding of species, recalling the cross-fertilisation which has taken place over the centuries. Wherefore the idea of cultivating planetary gardens and forests as a protector, considering both the wild grasses which try to grow through the sterile paving stones of cities and the rarest of tree species planted in prestigious parts with the same benevolence. It integrates the globalisation of the world today by means of its 'planetarisation' as a garden – that is, as a place for life: 'I would like to showcase the extremely broad diversity of what exists on the planet.'
He has recently announced the cancellation of 'the totality of his engagements with public and private services on French territory, with the exception of official or non-official cases where the establishment of resistance is confirmed'. The gardener-writer explains himself in his last book, titled Une écologie humaniste (A Humanist Ecology).

/5/ To mark the year 2000, the Parc de la Villette explored one of the major issues of the end of the century: the relationships between men and those between man and his environment. The theme of the Planetary Garden, its form and its scale – the nave of the Grande Halle (Large Hall) being transformed into 3,500 m2 of garden – give it an exceptional character, in keeping with the tradition of great exhibitions at La Villette.

/6/ In Ways of Worldmaking, Nelson Goodman questions the common belief that the resources available to the artist are more varied and impressive than those available to the scientist. The artist has access to modes of reference – literal and non-literal, linguistic and non-linguistic, denotational and non-denotational – in a variety of media. The scientist must take a strictly linguistic, literal and denotational approach. This is to ignore, for example, that science uses analogical instruments, uses metaphors in the case of measurement by example or yet again that in contemporary physics and astronomy it speaks of charm, strangeness and black holes. Even if the ultimate product of science, in contrast with that of art, is a literal verbal or mathematical theory, science and art proceed in the same fashion in their research and their construction.

/7/ Hans Jonas (1903-1993) The Imperative of Responsibility was published in 1979. He expressed his hopes for a radical change in the roles science and technology play in our society.

/8/ The Adapted Mind Jerome H. Barkow – 'Moralité et evolution humaine' (Morality and Human Evolution). Jean Pierre Changeux, Odile Jacob 1993.

/9/ Franz Kafka was born in Prague on 3 July 1883 and died in Kierling, near Vienna, on 3 June 1924. Born to a German-speaking Jewish family, he was one of the greatest Western writers of the 20th century.

/10/ Vilém Flusser (12 May 1920 – 27 November 1991) was a Czechoslovakian-born Jewish philosopher. Often considered to be a German philosopher, due to the fact that the majority of his publications are in German, he lived for a long period in Brazil and later in France, and his works were written in several different languages.

/11/ Berthold Brecht: (Eugen Berthold Friedrich Brecht), was a German poet, theatrical director and playwright who was born on 10 February 1898 in Augsburg (in Bavaria), and died in Berlin on 14 August 1956.: Vampyroteuthis infernalis mit Louis Bec, Göttingen 1989 ed. Immatrix

/12/ J Stephen Gould. Stephen Jay Gould (10 September 1941 – 20 May 2002) was an American palaeontologist, evolutionary biologist, and historian of science. He was also one of the most influential and widely-read writers of popular science of his generation, leading many commentators to call him 'America's unofficial evolutionist laureate'. Gould spent most of his career teaching at Harvard University and working at the American Museum of Natural History in New York.

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Ascott, Roy
Terror Incognito: Steps toward an Extremity of Mind

Just as earlier societies approached the terra incognito of the unmapped planet with fearful caution, and our emergent military/police state uses for its own dominance the hostility of its ideological antagonists to exacerbate a climate of terror, so we are encouraged by our scientists and institutions of learning to fear the extreme conditions of mind, to see altered states of consciousness as a threat to the orthodoxies of being, and the stabilities of social norms. This fear prevents research into mind at anything beyond the crudest form of reductionism. The paradox is that the most extreme, unnatural and hostile territory of mind is actually within us, at the simple, everyday level of thought and behaviour. For it is here that we find the most impenetrable barriers to expanded consciousness, and an ecology of mind blighted and laid barren by the constraints of fundamentalist rationality, which has led to the death and extermination of scientific idealism. As global warming accelerates, it is as much the ecology of the mind as of the earth that needs attention. The spiritual aspects of consciousness have been ignored to the detriment of global values and human ethics. We should understand also that institutional science has always seen art as a hostile territory where intuition is privileged over rationality, and reality is constructed without license.

To those ensconced in the Western scientific paradigm, the mind is nothing more than an epiphenomenon of the brain, and the brain is nothing more than a complex re-ordering of the history of the body, reliant as it is on the five senses, and on the environments within which it is situated. Why, it is argued, should the validity of anomalous forms of cognition and paranormal perception be recognised within the Western canon? Why should we accede to the idea, despite extensive first person reporting, of consciousness as a field phenomenon, which, when equipped with appropriate technology – telematic, chemical, virtual or vegetal –we can navigate on many levels, accessing many realities? Not only university chairs, and the coffers of science research funding, but society itself, it is thought, would collapse under the weight of such assertions. The mind, they conclude, is best kept in a box.

This has not prevented technology from attempting to parallel the phenomenology of psychic agency. The telematic effect has been to distribute mind, and to vitiate its isolated autonomy, while cyberspace affords the multiplication of identity, and the telepresence of the self. For the artist to break through the extreme environment of classical science, with the hostile intentionality of its authoritarian regime, into the quantum world of (psychic) potentiality and (spiritual) becoming, both courage and vision are called for. On the other side of the world, it is in the extreme and apparently hostile environment of the forest that a technoetic approach to human transformation is exercised. This involves the technology of plants, the application of nature to the navigation of mind, through rituals that conduct us to multiple worlds without barriers, to shared realities without boundaries, and to the redefinition of what it is to be human.

Roy Ascott, (26 October 1934), is the Professor of Technoetic Arts, President of the Planetary Collegium, University of Plymouth; Visiting Professor, Design|Media Arts, UCLA. roy.ascott@btinternet.com. Formerly: Dean of San Francisco Art Institute; Professor for Communications Theory, University of Applied Arts, Vienna; President of Ontario College of Art. Exhibited at the Venice Biennale, Ars Electronica Linz, Milan Triennale, Biennale do Mercosul, Brazil, European Media Festival, and Electra Paris, Founding editor of Technoetic Arts. He has advised media art organisations in Europe, Australia, Brazil, Canada, China, Japan, Korea and the USA, as well as the CEC and UNESCO. He convenes the annual Consciousness Reframed conferences.

http://www.planetary-collegium.net

Bakke, Monika
Zoe-philia and the Predicament of Anthropocentrism

Territorially expanding extreme environments of biotech labs call for reconsideration of the status of in vitro life inhabiting them. For that, I believe, we need to revise the status of all life in all forms including human form. This, however, may help to see body as multiplicity of interacting beings and life as "not only corporeal but also corporate". In my talk I would like to examine some of the wet media art works dealing with in vitro life forms which provide an interesting context for the debate on new bodies (e.g. 'extended body', 'liminal lives') emerging from the use of biotechnologies.

In vitro life dwells in a highly controlled new set up of man-made environmental network. In the case of tissue cultures, life is often viewed as stripped off its individuality traditionally attributed to body-as-unity, and yet, it is patented. Hence, it may be considered, in Agamben's terms, a 'bare life' that means life which is vulnerable, reduced to matter, and disposable in its moment of capture and passivity. This way of considering in vitro life is clearly the sheer extension of the anthropocentric perspective.

Nevertheless, in my paper, I will reject the victimizing and pessimistic way of dealing with in vitro life stated above. Instead, I will consider it in terms of *zoe* understood as a generative power, a pure vitality of life, evoking a need for an anti-individualistic and non-unitary subject. I will follow Rosi Braidotti's call for "reclaiming [our] *zoe*-philic location" sharing her view that we came to the point of urgent need for „new genealogies, alternative theoretical and legal representations of the new kinship system, and adequate narratives to live up to the challenge" of bio-technologies.

In order to do so we should fulfill "the minimum requirement" that is abandoning, or actually outliving, anthropocentrism. The case of in vitro life demonstrates the vitality of *zoe*, the ability of life to go on and inhabit environments not accessible for humans. In vitro life is not passive but it is an actant (Latour, Thacker) in the non-anthropocentric networks, that is the world astronomically bigger than ourselves.

Monika Bakke is an Assistant Professor of Aesthetics at the Adam Mickiewicz University, Poznan, Poland and an art critic. She writes on contemporary art and aesthetics with a particular interest in posthumanism, postanthropocentrism, and in cross-cultural and gender perspectives. She is an author of a book *Cialo otwarte* [*Open Body*] (2000), co-author of *Pleroma. Art in Search of Fullness* (1998), an editor of *Estetyka Aborygenow* [*Australian Aboriginal Aesthetics*] (2004), and *Going Aerial. Air, Art, Architecture* (2006). Since 2001 she has been working as an editor of a Polish cultural journal *Czas Kultury* [*Time of Culture*].

Barabasi, Albert-László,
The Architecture of Complexity

Systems as diverse as the world wide web, Internet or the cell are described by highly interconnected networks with amazingly complex topology. Recent studies indicate that these complex networks are the result of self-organizing processes governed by simple but generic laws, resulting in architectural features that are much more similar to each other than one would have expected by exploring them one by one. Indeed, how is it possible that the the Internet, the cell, or the social network have the same underlying architecture? How could the router know what a gene does in our cells? My goal is to discuss this amazing and beautiful order characterizing our interconnected work, and its implications to how we perceive the impact of links and connections on our life.

Albert-László Barabási is the Distinguished University Professor of Physics at Northeastern University, and directs the Center for Complex Network Research. He is also a member of the Center for Cancer Systems Biology at the Dana Farber Cancer Institute, Harvard University. Born in Transylvania, and educated in Bucharest and Budapest, he received a Ph.D. in Physics in 1994 from Boston University. His research has lead to the discovery and understanding of scale-free networks, capturing the structure of many complex networks in technology and nature, from the World Wide Web to the cell. His current research focuses on applying the concepts developed by his group for characterizing the topology of the www and the Internet to uncovering the structural and topological properties of complex metabolic and genetic networks. He is a Fellow of the American Physical Society, an external member of the Hungarian Academy of Sciences, and a foreign member of Academiae Europaeae. He is the recipient of the 2005 FEBS Annual Award for Systems Biology and the 2006 van Neuman Prize for Computer Science. His recent general audience book entitled Linked: The New Science of Networks (Perseus, 2002) is currently available in 11 languages.

http://www.nd.edu/~alb.

Blassnigg, Martha
Imaging the Extreme

In extreme environments where human bodies fail, their imagination persists. Through imagination we ‘explore’ virtual spaces at the edge of our perceptual boundaries and spectrum. From the limited perspective of what we know of the cosmos, audio-visual media seem to have taken over the imagination of outer space. Not surprisingly space science appears to have heavily invested in audio-visual technology, for example the Hubble's Advanced Camera for Surveys (ACS) and the Near Infrared Camera and Multi-object Spectrometer (NICMOS).

The visualization of outer space and space science at work (and science more generally as for example in the case of electro-microscopic imaging) comfortably apply techniques such as processes of tempering with colorization of black-and-white images whereby science and art merge on a pragmatic level. This, in combination with sometimes rather poetic subtitling, recall a remembrance of George Méliès’ fantastic visual journeys at the beginning of the 19th century. What has persisted (from the perspective of popular culture) or rather been re-introduced (from the point of view of science) appears to be a recognition and conscious investigation into the imaginary in order to acknowledge those dimensions and aspects that seem impossible to mediate.

This paper is going to highlight some aspects that critically question the complexity of the space science’s audio-visual ‘apparatus’– a term here understood as a social construction which has an ideological effect in much the same way as Jean-Louis Baudry and Jean-Louis Comolli have argued in relation to cinema. Furthermore it will discuss the concept of ‘images’ not any longer as ‘representations of reality’, but rather in a Bergsonian sense as full embodied relational networks through which in the perceptual process matter and spirit, outside and inside, meet.

The recent paradigm shift from objective science to a critical discussion of the observer in a variety of disciplines has revealed a new kind of transparency in the way that the technologies and techniques involved in image making reveal certain power structures, ideologies and social or political imperatives and also highlight the importance of the beholder.

What is at stake in this critical revision of the audio-visual culture of space science is the fact that the visual mediation of space seems to carry a meta-discourse of certain recent paradigm shifts which still has been ignored in the wider domains of space ‘exploration’ in their economical and political agendas. By applying the discourse of ‘apparatus theory’ and ‘interpretive methods’ from Cultural Anthropology this paper will critically reflect and attempt to dismantle the effects of the ‘technological imaginary’ of space imaging through a brief historical visual journey and the emphasis on the social-cultural construction of the perspective of the observer/beholder. It will also emphasize the near fatal attraction of the phantoms of ‘representation’ as the only possible description of the cosmos. In doing so this paper attempts to provide a conceptual framework for scientific-artistic interventions and collaborations in order to liberate space science from its materialist constrains and open their investigations for a broader context of the Humanities.

Martha Blassnigg is a Cultural Anthropologist and Film and Media Theorist with a background in documentary filmmaking and film restoration. She is a Materials Editor and panelist for Leonardo Reviews and works as a visiting researcher with Trans-technology Research at the University of Plymouth where she is undertaking philosophical and historical research in order to situate the metaphysical dimensions of technology within the processes of human perception and consciousness in relation the cinematic experience. Her most recent publications can be found in Leonardo, Convergence, Technoetic Arts and in the anthology Screen Consciousness: Cinema, Mind and World edited by R Pepperell and M Punt (Rodopi, Amsterdam, 2006). A full CV and publications list see http://www.trans-techresearch.net.

Beloff, Laura
Wunderkammer: Wearables as an Artistic Strategy

Keywords: wearable computers, wearables, hybrid space, wearability, mobility, connection, art

We are increasingly dependent on the technological systems in a constant connected world, where the traditional distinction between the physical and digital spaces is disappearing. Adriana de Souza e Silva has defined this kind of space as a hybrid space; "…a hybrid space occurs when one no longer needs to go out of physical space to get in touch with digital environments. Therefore, the borders between digital and physical spaces, which were apparently clear with the fixed Internet, become blurred and no longer distinguishable." /1/

The existing commercial telecommunication networks (f.e. wi-fi and mobile phone networks) have made the realization of the hybrid space possible. Likewise wearable computers and various mobile media devices play a major role in the production and usage of hybrid spaces. In hybrid spaces the nodes of networks are individuals rather than computers. These mobile nodes are in direct connection with the physical space, our everyday environment and simultaneously connected to the digital space.

The development of wearable computers has been motivated by the vision of personal empowerment with two primary goals; the need for people to access information while being on the move and the need for people to better manage information according to Barfield & Caudell /2/. We have invented glasses, microscopes, etc. to augment our vision and wristwatches to better manage our time. Recently we have developed mobile phones to better manage our lives and our social networks. The current wearable computer development and design is driven mainly by the concept of ubiquitous computing. The wearable technologies are expected to be invisible and responsive to the user as well as to the environment, which is also expected to be responsive.

Ana Viseu /3/ writes about body(nets) -which are bodies networked through at least one wearable device, that body(nets) condense and make visible many of the tenets that rule contemporary Western societies: a desire for mobility, continuous access to information, personalization, networking and control. These same desires have influenced a manifestation of an increasing amount of peculiar interfaces, which are emerging among other wearable works. Typically these experimental works are designed to be wearable and mobile, but do not necessarily otherwise fulfill the expected characteristics of wearables. The works are instead doing nearly the opposite, and one could question if they even should be called wearables. Wearability, though, is one the principle features in the works. These works are purposely constructed to be visible, they are not necessarily designed to be convenient to wear, and they are often designed to perform a single task. The occurrence of these kinds of works can be seen as a commentary towards the technological development in the society. They address concepts emerging from the fact that we are living in an increasingly technological and mobilized world, and reveal impacts of the technological systems, within which our lives are embedded.

The paper will investigate the role of these peculiar wearables within the systems they are placed in. The focus will be on artistic experiments, wearability as the key characteristic.

/1/ DE SOUZA E SILVA, A. (2006) From Cyber to Hybrid: Mobile Technologies as Interfaces of Hybrid Spaces. *Space and Culture, Sage Publications.*
/2/ BARFIELD, W. & CAUDELL, T. (2001) Basic Concepts in Wearable Computers and Augmented Reality. *Fundamentals of Wearable Computers and Augmented Reality.* Lawrence Erlbaum Associates, Inc.
/3/ VISEU, A. (2003) Shaping Technology / Building Body(Nets). *Sarai Reader 2003: Shaping Technologies*

Laura Beloff's main artistic practice during the recent years has evolved around participatory and networked installations and portable, wearable objects. She has exhibited widely in various exhibitions, museums, galleries and major media-festivals in Europe and worldwide. She is frequently lecturing about her interests and works in universities, various events and conferences. 1999- 00 she was a visiting professor at Linz Art University, Austria. 2002-2006 she was a professor for media arts at the Art Academy in Oslo, Norway. 2007-2011 5-year grant by the Finnish state. Currently she is lecturing at The University of Art and Design Helsinki, and working towards PhD within Planetary Collegium, Plymouth University.

http://www.realitydisfunction.org/

Boland, Howard / Cinti, Laura
The Martian Rose

The Martian Rose features a rose exposed to a Martian environment using a planetary biochamber.

Keywords: Mars, Rose, Otherness, Mars simulation chamber, Extreme environments

Introduction

The initial proposal for *The Martian Rose* involved genetically engineering a rose for stress tolerance in extreme environment. Part of the research revolves around alienisms, symbolism, ornamentation and culture. Dreaming of a Martian rose is a rather naïve delve into symbolic and perhaps visual imagery, but it doesn't offer any consolation in terms of beauty – its poetic imagery merges with the harsh conditions of its destination and the alien is created. What does it mean to create life for Mars? What kind of life are we talking about? Is it our goal to make Mars habitable? Unless life is found, our only option seems to have a Mars which would be, if not totally, genetically engineered. Does this change anything? As the search for life is still ongoing, the inter-planetary treaty is still strict on the contamination of Mars, but if Mars was found to be dead, future transplantations could become a possibility.

The Martian Rose

The Martian Rose opens avenues for interaction with a rose pre-subjected to proxy Martian parameters. The *Martian* rose will sit within a chamber appropriated for viewing. The installation aims to open discourses and communicate ideas of the extreme environment found on Mars and also shows how scientists explore this environment here on earth. By exposing a rose to this environment, the audience can see and experience what is produced. This will allow audience to gain an understanding of what we are left with and reflect on both the Martian atmosphere and how technologies are used to simulate and understand this environment.

Conclusions and Further Work

The Martian Rose attempts to stay within the framework of botany and to look at reconstruction of life for extreme conditions which would include the potential aesthetic breakdown through genetic conditioning (i.e. no flowering) as well as carrying a romantic idea of giving a rose for Mars. Discussions around the project revealed outlooks of a merely cryogenic frozen rose in an unprotected environment and led us to reformulate the project into its future stand - which considers more suitable biological specimens - extremophiles. This is perhaps less romantic but allows us potential habitational environments and ecologies. A proposed avenue is to alter the actual parameters in order to find zones or spaces where life can exist and to investigate what extent this life becomes otherness. Our overall aim will attempt to explore strategies of engagements, experiences and interactions with live biological specimens within a biochamber initially conditioned to a Martian environment.

Acknowledgments

The authors would like to thank; Mars Simulation Laboratory [University of Aarhus] particularly to Dr Jon Merrison for conducting the experiment with us and to Dr Per Nørnberg for allowing this to happen.

Office for Contemporary Art Norway for their generous support in funding the installation. The Open University; Professor Nigel Mason for research evaluation and Professor Charles Cockell for correspondence and relaying the project. The Arts and Genomic Centre, University of Amsterdam, where we initially presented The *Martian Rose* at its launch.

UCL Graduate School for Bursary Award for BA Festival of Science (British Association for the Advancement of Science),

c-lab (http://c-lab.co.uk) is an artistic platform based in London engaging in scientific culture through critical and contemporary amalgamations of bio and electronic art. Projects have been exhibited and presented internationally.

Laura Cinti is an artist/researcher focusing on modern biotechnology and plants. Her works have featured in international publications. Currently she is furthering her practices through a PhD at University College London.

Howard Boland is an artist engaging in range of technologies with focus on language and narrative process in the contemporary intersections of art and science. He worked extensively with award winning interactive productions for clients such as *HSBC*, *Vodafone*, *Sony*, *V&A and Microsoft*.

Brown, Paul
The DrawBots

In 2005 an international, multi-disciplinary, inter-institutional group of researchers began a three-year research project that is attempting to use evolutionary and adaptive systems methodology (evolutionary algorithms, neural networks, etc…) to make an embodied robot that can exhibit creative behaviour by making marks or drawing (in the most general sense). The research is titled "Computational Intelligence, Creativity and Cognition: a multidisciplinary investigation" and it is more popularly known as the DrawBots project. The research group is composed of computer scientists, cognitive scientists, philosophers, engineers, artists, art theorists and art historians. One outcome of the project will be a large-scale art installation of a group of DrawBots. Other outcomes will include the various research publications reflecting the vested interests of the group both as independent researchers and as a group.

The research has two, mutually dependent, contextual frameworks. One concerns methodologies for making an agent that has the potential for manifesting autonomous creative behaviour. The second concerns methodologies for recognising such behaviour. Another emphasis is attempting to place this work in an art historical context. Amongst the key concepts that the project is examining are: personality, autonomy, value, signature, purpose, novelty, embodiment, social context, environmental interaction, ownership and so on…

For the Mutamorphosis meeting we propose a paper that places the DrawBots, as new mutations, in a hostile human environment. It is well known that humans are historically inept at recognising new creative behaviours amongst themselves. Examples include: the Salon des Refuses where works by Monet and his fellow Impressionists were spat upon by "knowledgeable" Parisian art critics, the neglect of Bach as a major figure for over a century until his reinstatement by Mendelssohn, the status of graffiti in most modern cities and, in the scientific domain, the many examples used by Kuhn to illustrate his theory of paradigm shift /1/. It is only recently that humans have been able to acknowledge creativity in other animals so how can they recognise creativity when it emerges from an alife agent?

Artistic precedence for creative autonomy appears in the mid/late-20th century with works like Nicolas Schöffer's CYSP 1 (1956) and Edward Ihnatowicz' Senster (1970). Ihnatowicz was aware of the work of the developmental psychologist Jean Piaget and suggested that machines would never attain intelligence until they learned to interact with their environment /2/. Although at the time this was an unpopular approach (the AI discipline was dominated by top-down ideology) Ihnatowicz laid down an important foundation for future, embodied, artificial life research and directly influenced the DrawBots project. Another influence is the writing of Jack Burnham who suggested in "Beyond Modern Sculpture" /3/ (1968) that the future for art was the production of "life-simulation systems".

Final paper will be multi-authored by Paul Brown, Jon Bird, Dustin Stokes, Bill Bigge and others.

References:

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/2/ Brown, P., From Systems Art to Artificial Life: Early Generative Art at the Slade School of Fine Art, in Gere, C., P. Brown, N. Lambert & C. Mason (Eds.), White Heat Cold Logic: British Computer Art 1960 – 1980, MIT Press, Leonardo Imprint, to appear
/3/ Burnham, J., Beyond Modern Sculpture, New York 1968

Paul Brown is an artist and writer who has specialised in art, science & technology since the late 1960s and in computational & generative art since the mid 1970s. His international exhibition record spans four decades and includes the creation of both permanent and temporary public artworks. He has participated in shows at major venues like the TATE, Victoria & Albert and ICA in the UK; the Adelaide Festival; ARCO in Spain and the Venice Biennale. His work is represented in public, corporate and private collections in Australia, Asia, Europe, Russia and the USA. He is currently (2005-08) visiting professor and artist-in-residence at the CCNR, University of Sussex where he is working on a project to evolve robots that can draw.

http://www.paul-brown.com

Chapple, Boo
Bodies of Water

Oceans, lakes, rivers, aquifers, cities, nations states and living organisms. Bodies of water are both systems in themselves and points of accumulation in the course of larger cycles. How these systems and cycles inter-relate has been and will continue to be of critical importance in 'the evolution of living beings and the societies they constitute'. Cities have been established and shaped according to the proximity, availability, and transport of water. Wars have been and continue to be fought over it. Living organisms cannot, for the most part, survive without it. As the global balance tips closer to the extreme environmentally, the politics of water intensify. Water and capital flow together – access to clean drinking water is a luxury that not everyone is able enjoy.

Bodies of Water is a project that engages with the politics of water in the context of an artist residency with the 'Contaminated Life' Designing the Future project at RMIT University; a joint venture between the Schools of Architecture and Design, Environmental Science and Social Science. The project involves working with the students from these disciplines to draw together extreme designs and artistic speculations on a future of water scarcity. It focuses on the human body as a site of accumulation, taking water recycling to the most intimate level and proposing a means to engage in a water economy for those whose only asset is their own biology. Conceptually, it engages with alchemical archytypes and rituals of self purification and operates to disrupt conventional conceptions of purity and contamination, waste and commodity, sparsity and excess.

There are two simultaneous strands of investigation around which the project is structured:

Autologous: Pure survival
Here we are concerned with various means of collecting and recycling excreted water in the form of sweat, breath and urine – of feeding the body back to itself. While NASA has long been engaged in the design of such systems for use in space, I am more interested in how they might be integrated, aesthetically and functionally, into everyday terrestrial use.

Autologous: Alchemy for a global economy
This aspect of the project is involved with extracting metabolic bi-products from human excreta for use in the production of cosmetic and pharmaceutical products. This is sustainable agriculture for the new world order. Income earned from such self-pharming operations can potentially be used to buy enough water to keep the system going. My presentation will cover outcomes and prototypes designed and produced over the course of the project, which takes place throughout 2007.

Boo Chapple is an artist and researcher whose work focuses on processes of material-technical transformation that operate at the boundary between life and non-life, bodies and culture. She holds a Masters of Design from RMIT University and has recently completed a year long residency at the SymbioticA art and science collaborative research laboratory, in the School of Anatomy and Human Biology, at the University of Western Australia. Her work has been exhibited at the Beijing Biennale of Architecture, and in an exhibition of Australian sound art at the San Francisco MoMA. Her recent essay 'Journeys to the Other Side of the Navel' has been published in a forthcoming book 'Art of the Biotech Era'. Boo is currently employed as Artist in Residence in the Designing the Future Program at RMIT.

http://corpuseclectica.net
http://corpuseclectica.net/blog/
http://www.liveness.org/contaminated-life/

Chardronnet, Ewen
Dissemination and the Becoming-World of the Laboratory

In 2005, at a London banking conference to which The Yes Men (1) had accidentally been invited because of their satirical website, « Dow representative » « Erastus Hamm » unveiled « Acceptable Risk, » a Dow industry standard for determining how many deaths are acceptable when achieving large profits. Without shocking anyone. If corporations were completely free to behave as the market demands then industrial catastrophes of huge magnitude, such as Bhopal, would not necessarily be disadvised.

Not a hoax but proposing an assumed methodology, the English firm « Strategic Communications Laboratories » (2) specialized in « operations of influences » of « psychological warfare » (or « psyops ») went « mainstream » at the London 2005 Defence Systems & Equipment International Exhibition. Main attraction was a counterpart on scale 1 of one of its « ops center », presenting simulations going from the natural disasters, chemical catastrophes to the coups d'etat. What thus leads the firm to desinform the public for the account of any State, to deliberately supporting the dissemination of false information, handling the public and the history, for dubious « assumptions » on « acceptable risks ».

The dominant phenomenon of the time has been the continual artificialisation of life, a process in action for a century in which science and the economy are supporting eachother. With the acceleration of the market exploitation on the « the natural limits of the planet », new experimental technologies must be tested in « real conditions » and the world in which we live has become furiously experimental. But in the meantime the new possible applications of science are so open that they should not be transfered in the civilian world without supervision. The difficulty for the States is thus also in the policy of control of exports of materials and significant technologies that oftenly have a double potential use, civilian and military.

In the global governance then, the politics of dissemination is crucial. How to test in « real conditions » pharmaceutical researches and GMOs, rfids, nanotechnologies and electromagnetic weapons, without disseminating hazardous results ? How to use such unstable technologies without losing control on their dissemination ? How to do such researches without disseminating the informations in the medias and alarming the public opinion ? How to control the so-called antagonist « agents of dissemination » that are as diverse as the society (3) ?

The mails, transports, opened borders, the Internet, the telephone, the radio-waves, the bodies, the air… facilitate the dissemination. And with the hackers, the artists, the migrants, the journalists, the scientists, the peasants and the civil society in general contributing to the problem, only a totalitarian state can imagine to win a war in which were targeted the « total information awareness » and the « full spectrum dominance ». The most urgent to do for independant organisations is then to propose alarm systems and information harvesting tools to study the unforeseeable consequences of the risky actions of our « world-laboratory ».

Ewen Chardronnet is a media artist and journalist who works and lives in Tours, France. Widely published, he has been collaborating in different initiatives such as Makrolab (4), MIR (5), Acoustic Space Lab (6), Spectral Investigations Collective (7), Ellipse (8) and World-Information.Org (9). He has published "Quitter la Gravité" (Leaving Gravity), an anthology on the Association of Autonomous Astronauts (L'Eclat, 2001) (10) and has received in 2003 the Leonardo New Horizons Award together with the Acoustic Space Lab network.

1 - http://www.theyesmen.org
2 - http://www.scl.cc
3 - http://caedefensefund.org
4 - http://www.i-tasc.org
5 - http://www.artscatalyst.org/projects/space/Space_MIR_INDEX.html
6 - http://acoustic.space.re-lab.net
7 - http://semaphore.blogs.com
8 - http://e-ngo.org
9 - http://world-information.org
10 - http://www.lyber-eclat.net/lyber/aaa/quitter_la_gravite.html

Cílek, Václav
Climate as the Last Wilderness

We are nostalgic when we lose the phenomena we have fought with – open unknown seas, rainy forests, high plateaus or deep caves. We as the mankind we have grown through these fights and we have gradually become stronger than most of the sea storms, underground rivers and deep forests. Civilisations are evolving when they fight with nature and shrinking when they start to fight with themselves. The last wilderness that remains is climate. This relationship is far from being friendly or melancholic one. It is a threat of the magnitude of Pacific Ocean in 15th century. We know now that climate is stronger and does not care about consequences. What we should talk about are not only the real impacts of climate change but the archaic processes how we deal with wilderness – fears, awe, conflicts, reconciliations and finally protection. But we are at this moment at the very beginning of a deal with a new God of Climate Change.

Václav Cílek studied Mining Institute and Faculty of Natural Science of Charles University. Be became involved in study of hydrothermal deposits, later he studied samples brought from Moon by Russian satellites and then he focused some twenty years ago on climate change and environmental issues. He combines the knowledge of humanities with natural science. He teaches at several universities (Faculty of Liberal Art, Academy of Fine Arts, etc.) the topics that deal with landscape evolution, environmental changes, emergence of new mentality and intellectual history. He is author of approx. 340 scientific topics and several books including award winning “Inscapes and Landscapes; Makom Book of Places“.

Clark, Tim
Massive Multiplayer Online Games and Anthropic Bias: The Role Game Creators, Possible “Life” World Scenario’s, and the Doomsday Argument

This paper critically examines Nick Bostrum’s “general theory of observational selection effects” with the view of proposing a set analytical possibilities that may be applied to the socio-cognitive role of game creators in the development MMOG‘s. In 2003 the young Swedish philosopher and mathematician Dr. Nick Bostrum published his controversial paper, “Are You Living in a Computer Simulation.” As the first ever Director of The Future of Humanity Institute located at the Faculty of Philosophy & James Martin 21st Century School, Oxford University, his areas of research interest and policy development are, “global catastrophic risk; human enhancement; judgment(s) under uncertainty.” The term “Anthropic“ first appeared in a paper by the theoretical physicist Brandon Carter in 1973 at a conference to mark the 500th birthday of Nicholas Copernicus. Known as the Weak Cosmological Principle its states that “*the observed values of all physical and cosmological quantities are not equally probable but they take on the values restricted by the requirement that there exist sites where carbon-based life can evolve and by the requirement that the Universe be old enough for it to have already done so*.”–

The doctrine of WAP is a variant of the René Descartes “Argument from the Primancy of First Person Epistemic Experience (APFEP).” It states that the primary methodological condition that has to be met for any verifiable truth claims, ced claims must arise from the epistemological relationship between each person‘s cognitive experience and what is experienced - self-reflective consciousness relative to their body and the external world. One immediate consequence of this argument is that any truth claim(s) and consequent predictions derived from these claim(s) must themselves be constrained by APFEP insofar as it represents a primary limiting condition on any truth claim. However, the question arises how do we know that for any proposition *x, x* is true given this initial limiting condition. Descartes response to the question of “Anthropic Bias” is his *Argument from the Evil Demon*, or, the *Argument from Theocentric Stability.*– Descartes concluded that the evil demon argument must be false because the world has, in fact, been so constructed by God that it is understandable.

Bostrum’s question “Are You Living in a Computer Simulation” is a version Descartes’s argument but, with two very important conceptual twists. In the first case there is, to quote Bostrum, “the significant probability” that a percentage of persons that we interact with are, in actuality, “Computer Simulation(s).” Moreover, these simulations are a future, “catastrophic” result of the exponential growth of the technological implementation of computationally based cognitive

activity that, at some point, leads to the emergence of fully realizable, simulated“ life streams.”

Does Bostrum actually take this argument seriously!? This question is misplaced inasmuch as Bostrum is concerned with hypothetical, “Doomsday” scenarios with regards to possible world situations that are themselves a function of a number of known socioeconomic, technological, and emergent unknown factors. His theory provides for a rational set of arguments constructed around a “general theory of observational selection effects” that permits us to constrain the problematic consequences the “Anthropic Bias.”

[1] Frank Tipler and Brandon Carter_ [2] In honor in the Wachowski's brother’s film T*he Matrix* we can also refer to it as *The Matrix Argument*._

Tim Clark has been working as an interdisciplinary artist and art historian in Canada for more than 25
years. He is founding member of Hexagram: Institute for Creation/Research in Media Arts and Technologies in Montréal, Québec. He is also the co-founder with Professor’s Chantal Dupont, Leila Sujir and David
Tomas of the Concordia University-L'Université du Québec à Montréal {UQAM} research group Archivage
et exploration de nouvelles formes narratives audio/video numériques.

With respect to his work as an art historian his research on focuses on three research areas: one, the developmental interrelationship between The Argument from Human Creativity and the Computationalist and
Hypercomputationalist Theories of Mind; two, the work of the Swedish philosopher and mathematician
Nick Bostrum; and three, post-secular theory and Theological Aesthetics

http://imca.concordia.ca/
http://hexagram.ca/spip/index.html

Cusack, Peter
Sounds from Dangerous Places

Recent travels have brought me into contact with some difficult and potentially dangerous places. Most are sites of major environmental/ecological damage, but others include nuclear sites or the edges of military zones. The danger is not necessarily to a short-term visitor, but to the people who live there or through the location's role in geopolitical power structures. Some are areas where extreme and hostile conditions have been created, in others the danger has been hidden or absorbed into the local economy. In yet others regeneration is underway. Such places include the Chernobyl Exclusion Zone, Ukraine; the Caspian Oil Fields near Baku, Azerbaijan; the Munzur River (a Euphrates tributary) valley in Kurdish Turkey where 19 very controversial dams are planned; Thetford Forest beside USAF air bases in the UK; North Wales in the areas where Chernobyl fallout will effect farming practice for years to come.

Many sound recordings were made at these sites. Photographic and other visual images were taken. Interviews and background research provide textual documents. It is noticeable that environmentally damaged sites can be both sonically and visually compelling, if not beautiful and atmospheric. There is, often, an extreme dichotomy between an aesthetic response and knowledge of the 'danger', whether it is pollution, social injustice, military or geopolitical.

"Sounds From Dangerous Places" asks the questions, "What elements of the soundscape of a dangerous place are effected, changed, created or destroyed as a result of its 'dangerousness'? and, "What insights can sound offer into the environmental, social and political contexts of a 'dangerous place'?" The project presents the field recordings as they are, in the belief that such recordings offer insights into the locations and issues that are different from, and complimentary to, those of visual images and texts. Supplementary questions are "What information about place can field recordings give that is special to sound?" and conversely, "What information is given by the other media that sound cannot?"

The presentation will concentrate on one of these places - Chernobyl. Sounds and images from in and outside the exclusion zone will be shown to promote a discussion amongst those present of what is being gained through hearing and what from seeing.

Peter Cusack, based in London, works as a sound artist, musician and environmental recordist with a special interest in acoustic ecology. Projects range from community arts to research into the contribution of sound to our sense of place and documenting areas of special sonic interest, e.g. Lake Baikal, Siberia. His project 'Sounds From Dangerous Places' examines the soundscapes of sites of major environmental damage. He produces 'Vermilion Sounds' the environmental sound series on ResonanceFM Radio, London, lectures on 'Sound Arts & Design' at the London College of Communication and is currently a research fellow on the multidisciplinary EPSRC's 'Positive Soundscapes Project'. CD recordings include 'Your Favourite London Sounds' (Resonance) and 'Baikal Ice' (ReR).

da Costa, Beatriz
Pigeonblog

A Project by Beatriz da Costa, with Cina Hazegh and Kevin Ponto.

PigeonBlog enlists homing pigeons to participate in a grassroots scientific data gathering initiative designed to collect and distribute information about air quality conditions to the general public. Pigeons are equipped with custom-built miniature air pollution sensing devices enabled to send the collected localized information to an online server without delay. Pollution levels are visualized and plotted in real-time over Google's mapping environment, thus allowing immediate access to the collected information to anyone with connection to the Internet. □

By using homing pigeons as the "reporters" of current air pollution levels we are hoping to achieve two main goals: 1) to re-invoke urgency around a topic that has serious health, environmental and political consequences, but lacks public action and commitment to change; and 2) to broaden the notion of grassroots scientific data gathering while building bridges between scientific research agendas and activist oriented citizen concerns.

Pigeonblog was inspired by a famous famous photograph of a pigeon carrying a camera around its neck taken at the turn of the last century. This technology, developed by German engineer Julius Neubronner for military applications, allowed photographs to be taken by pigeons during flight time. This early example of using living animals as participants in early surveillance technology systems made us pause. What would the 21st century version of this combination look like? What types of civilian and activist applications could it be used for?

With PigeonBlog we hope to make a contribution to the atmospheric and health sciences by introducing a low cost model of obtaining data that would compliment data obtained by the fixed monitoring sites, and would validate urban air shed models of pollution dispersion in areas where fixed monitoring site data are not available. □

However, the projects' main concern lies is in addressing the following questions: How can a non-academic public become involved in scientific data gathering? How can an "old topic" such as air pollution be addressed through artistic means in an effort to increase public interest and support for solutions to these problems? How can real-time information about current localized pollution levels be made public? How can a mutual beneficial human and non-human relationship be developed in an urban context inhabited by both beings? How can we "re-script" our relationship to technology and the city, and build our own hardware and sensing devices? □□

And finally, how can we contribute to a techno-scientific discourse that takes political, research and artistic concerns into account on an equal footing? □

Beatriz da Costa, German (lives and works in the United States), 1974, Associate Professor of Studio Art, Electrical Engineering and Computer Science, University of California Irvine, Irvine, California, USA, www.beatrizdacosta.net, beatrizdacosta@earthlink.net. Beatriz da Costa is an interdisciplinary artist and researcher working at the intersection of contemporary art, life science, engineering and politics. Her work takes the form of public participatory interventions, locative media, conceptual tool building and critical writing. da Costa has also made frequent use of wetware in her projects and has recently become interested in the potential of interspecies co-production in promoting the responsible use of natural resources and environmental sustainability. Other issues addressed in her work include the use of emergent technologies to investigate context specific configurations of social injustice, the politics of transgenic organisms, and the social repercussions of ubiquitous surveillance technologies. Through her work da Costa examines the role of the artist as a political actor engaged in technoscientific discourses.

Daubner, Ernestine
Art, (bio)technologies & (dis)abilities: Challenges of an Expanding Body/Mind

Necessity, it is said, is the mother of invention. Certainly, physical and mental limitations have triggered technological explorations ever since the invention of the first tools. Breakthroughs in science and technology over the centuries have increasingly expanded the mobility of the human body in the world through the invention of the wheel, automobile, airplane, even rocket science; they have also enhanced human communicative abilities, as well as imaginary and cognitive capabilities through incremental advances in diverse telecommunication or information technologies. While expanding human capabilities enormously, each innovation also spawns a network of interrelated events that affect the socio-cultural realities of humans in the world, sometimes radically. The histories of modern progress bear witness.

At the intersection of contemporary (bio)media art projects, current bioscientific research and technological innovations, one encounters astounding new ways in which the limits of the able and disabled body and mind are enhanced or expanded. In this paper, I would like to provide an overview of some key innovative work done in this area by artists, scientists, and theorists. At the same time, I would like to provide a synopsis of critical issues relating to art, biotechnologies, artificial life and diverse electronic technologies, particularly as they relate to the question of normative and challenged mental capacities and the able and disabled body.

In diverse ways, advancements in prostheses, orthoses as well as telematic, virtual reality, biofeedback, sensor and other electronic technologies, prompt one to reconsider pre-conceived boundaries between the physiological, cognitive, psychological, and imaginary realms. With the ability to see a landscape with one's ears, to hear music with one's eyes, to speak movement, to create (musical) sound with one's body, to counter gravity or to otherwise expand one's mental and bodily states, it is evident that preconceived distinctions between the senses disappear. Mind, body and the world coalesce in strange new ways. Wet technologies similarly defy traditional preconceptions about the interrelationship between body, mind and the world.

Gene therapy, assisted reproductive technologies, tissue culture, (RFID) implants, nanotechnologies are but a few biotechnologies that are currently altering one's notion of the healthy, normative body, its ability to heal and regenerate itself, and its capacity to operate autonomously with expanded sensorial and cognitive abilities. Many of these developments promise enormous benefits in health, longevity and well-being, but also present a host of difficult ethical, moral and philosophical questions.

By providing examples of key developments in these areas, I wish to cast a light on some astonishing (bio)media art projects, bioscientific and technological innovations appearing on the horizon, as well as to articulate some of the significant issues and challenges that are about to confront the newly expanded body/mind.

Ernestine Daubner holds a PhD in the Humanities from Concordia University where she teaches in the Art History Department. She is currently mapping out the emerging field of contemporary art and biotechnologies in collaboration with *le Groupe de recherche en arts médiatiques* (GRAM) and the *Centre interuniversitaire en arts médiatiques* (CIAM) at the Université du Québec à Montréal, where she is Adjunct Professor. With Louise Poissant, she co-organized an international colloquium *Art & Biotechnologies* in 2004 and co-edited a book of collected essays *Art et biotechnologies*, which includes a DVD-ROM anthology of a-life and bioartworks. She is presently co-organizing a colloquium entitled, *Mobile / Immobilized: Art, Technologies and (Dis)abilities*.

Diebner, Hans H.
Cultural Evolution and the Internet – A Critical Approach

Memetics is a controversially debated evolutionary theory of culture. The basics have been introduced in the 1970s by the notorious popular scientific writer R. Dawkins (The Selfish Gene) as an analogy to genetics. In his view, a "meme" corresponds to a "cultural gene" which determines "cultural evolution" through its "cultural fitness." The theory affected people in either a fascinated or an averse way. This is partially due to Dawkins rather extreme social Darwinistic thinking and anti-religious attitude: Religion is an evil virus of the mind. Memetics recently migrated as a fundamental paradigm into what is called "sociophysics" and "econophysics." The propagation and survival of trends, ideas, opinions, and so on – i.e., of memes – is studied on the basis of epidemiological models. The analogy between the propagation of memes and the spread of viruses stimulated an innovative approach to marketing called "viral marketing." Innovative measures like the famous "Moorhuhn" video game, or YouTube's "lonlygirl" phenomenon try to brake up traditional marketing design. A gradual dissolution of the borders between art, science, and economics can be observed. This innovative measures in marketing and design are accompanied by dynamical models and monitoring systems in order to predict trends and to intervene accordingly. IT and the internet are vital for the viral marketing success. The dynamical memetic models enfold their significance in the internet due to straightforward access to empirical data. As a result of the easily detectable and traceable trend and opinion propagation in the society, represented through the blogosphere, viral models of cultural aspects of society became powerful tools for the control and the "design" of culture, like genetics can be used to design desired species – for better or for worse. A good piece of design, a work of art, even the work of net-activists, may be a well designed integral part of a control strategy. The "democratizing" effect of the internet is foiled by an extreme representationalism that reduces Being to data. In line with Lukac and Heidegger I call this "Verdinglichung" (reification), a concept that is worth being revived in the present context. Heidegger diagnosed a general tendency in science and technology of Verdinglichung and a crucial aspect in the arts of being able to twist out from Verdinglichung. This results from the performative character of art, which contrasts with the semiotic-based or representational character of science and technology. If one accepts performativity as counterweight to the representational approach in science it becomes clear that memetics in its extreme considerations of being able to capture processual aspects of Dasein in a representational way, is a categorical mistake. The tendency in the ongoing discourse to level the "cultures" should be substituted by a theory of negotiation, which can be called a third episteme beneath art and science. The internet, which is not a rhizomatic structure in itself, presents us with a challenge that we should encounter in a rhizomatic way, to use Deleuze's expression for the negotiation between the poles that constitute a difference.

Hans H. Diebner is currently project manager at the Institute for New Media, Frankfurt/Main, Germany. From August 1999 till December 2005 he used to be founding director of the Institute for Basic Research at the Center for Art and Media in Karlsruhe, Germany. He is trained in physics and received his diploma degree in 1994 and the doctoral degree in 1999, both supervised by Otto E. Rössler, in the fields of complex systems research. Hans Diebner‘s research interests are complex systems seen from the modeling as well as the philosophical perspective. His current focus is "Performative Science and Operational Hermeneutics". This concepts comprise he investigation of the evolution of knowledge in a combined artistic, system-theoretical and hermeneutic way. The concept of "performative science" has been published recently: H.H. Diebner: Performative Science and Beyond, Springer, Wien, 2006. For details see http://diebner.de .

Diennet, Jacques / Calvet, David / Kronland, Richard / Voinier, Thierry / Vallée, Claude

The COSMOPHONE: Playing with PARTICLES, the COSMOS and SOUNDS

Our planet is continuously bombarded by cosmic rays made of protons and atomic nuclei which are emitted from throughout our galaxy. As they hit the upper atmosphere, they create avalanches of elementary particles. The most penetrating of these are muons, which can reach sea level. A muon is a type of heavy electron not found in ordinary matter because it has a very short life time. The human body is insensitive to muons, even though several muons pass through us every second. The cosmophone is designed to turn this into an observable phenomenon as it takes place around us.

Muons are detected by the very faint bluish light they generate in plastic scintillator strips. Since muons travel close to the speed of light, their trajectories can be determined by two sensors hit almost simultaneously within two detector arrays deployed on the ceiling and the floor. A muon will occasionally interact above the detection system and create a photon and electron avalanche which lights up more detectors. These electromagnetic showers differ in size and are an essential additional source of randomness in the detected phenomena. The light signals left by the muons and electromagnetic showers are transformed by photomultipliers into electric impulses lasting a few billionths of a second, captured by fast data-acquisition electronics and transmitted almost instantaneously to a sound synthesis system.

The aim of the sound synthesis is to materialise the trajectories of cosmic particles (muons and electromagnetic showers) in space as they move through a given point at a given instant. The sounds are produced digitally by a computer which operates a loudspeaker array hooked up directly to the sensors. The composer is free to choose and program which sound effects should in real time be associated to the detected phenomena. Museum applications favour sounds which mimic the particles properties: the sound travels from the muon upper entry point down to its floor exit point, shifting its frequency as it goes, much like a moving sound source (Doppler effect). The electromagnetic showers are materialised by trickling or streaming sound envelopes.

The cosmophone is the meeting point of advanced basic sciences (astrophysics and particle physics), new technologies (real-time digital sound synthesis and sound spatialisation) and contemporary art (environmental music and systems), fields where mutual fertilisation may offer a potential source of innovative developments.

By putting spectators at the junction of the infinitely small (the elementary particles passing through their bodies) and the infinitely large (the cosmos from where they originated), the cosmophone brings the listener into direct contact with our galaxy and the violent phenomena that take place there, stimulating a world of imagination that can offer new scope for artistic creation.

Jacques Diennet is artistic director of the Music Compagny « UBRIS STUDIO ». During several trips to the USA and Canada where as Robert Ashley'guest, he worked in the Mills College Studios and as John Appleton's at the Darmouth College Studios, he became familiar with digital composition on Synclavier. His music, « mixed » music and live digital synthesis has taken him to many parts on the word. His intellectual guide is John Cage and all those advocate music which is gentle and non-dogmatic. Jacques Diennet has received severals international prizes including: First Price of the town of Varèse Competition Ruigi Russollo and First Price of work for multimedia to the Bourges International Competitions in 2000.

Richard Kronland-Martinet received a Ph.D in Acoustics from the University of Aix-Marseille II (France) in 1983. He received a "Doctorat d'Etat es Sciences" in 1989 for his work on Analysis and synthesis of Sounds using Time-Frequency and Time-Scale Representations. He is currently Director of Research at the National Center for Scientific Research (CNRS), Laboratoire de Mécanique et d'Acoustique in Marseille, where he is the head of the group "Modeling, Synthesis and Control of Sound and Musical Signals". His primary research interests are in Analysis and Synthesis of Sounds with a particular emphasis on musical sounds, including active participation in several artistic projects.

Claude Vallée, 49, is a French CNRS researcher in particle physics. Former student of the Ecole polytechnique, he has participated to several experiments based on some of the main high-energy particle accelerators in the world. He is currently spokesman of the H1 Collaboration, on the electron-proton collider HERA in Hamburg. Since 1998, C. Vallée has initiated the development of the Cosmophone with colleague experts in sound synthesis and psycho-acoustics. Several cosmophones have been built under his supervision, out of which one is permanently displayed at the Cité des Sciences in Paris, and another one is exploited by the company Ubris Studio for artistic shows. In 1999, the cosmophone was awarded the “Prix Création de la Culture Scientifique” by the French Ministry of Research.

Thierry Voinier is a research engineer at the French National Center for Scientific Research
(CNRS), Laboratoire de Mecanique et d'Acoustique in Marseille. He is mainly involved in sound analysis and synthesis projects, providing his expertise in real-time algorithmic implementation. He designed several digital synthesis musical

instruments, and digital audio effects for composers. He is one of the inventors of the Cosmophone, for which he conceived the moving source synthesis engine.

David Calvet is a researcher at the French National Center for Scientific Research (CNRS), Laboratoire de Physique Corpusculaire de Clermont-Ferrand. He has participated to several High Energy Physics experiments at CERN (Geneva) and DESY (Hamburg). In parallel, he has also worked on a few projects related to science popularization, including the Cosmophone, for which he designed the detection and data acquisition parts.

http://cosmophone.in2p3.fr

Donegan, Mick / Goodman, Lizbeth / Kennedy, Helen / Palmer-Brown, Dominic / Zhang, Li
InterFACES: Affective Interactive Virtual Learning Environments for People with Cognitive & Physical Disabilities

This paper summarises the work to date on the InterFACES Project (SMARTlab's research effort to create accessible interfaces for people with extreme physical disabilities, to allow a human 'face' to new technologies), as that work has in the past year evolved in tandem with the 'Cogsys' Project, involving an extended team of collaborators in Neural Networks and Learning Methods for People with Learning Difficulties. By outlining the joint aims and achievements of the projects to date, this paper shows how the results of our research into assistive technologies for communication, can be applied directly to the field of learning disability, with a new set of neural network and epistemic processes to be developed in the next phase of planed trials.

Many users with cognitive disabilities have difficulties in reading, writing and learning which severely limit effective interaction within communities. Though assistive technology has to some extent provided for these special groups on the Internet, current systems fail to allow these users to express themselves effectively and engage in meaningful interaction. Intelligent virtual tutors and virtual actors for entertainment and language training have been explored, but few attempts have been made to optimise an interactive virtual learning environment specifically for users with cognitive disabilities, providing learning that engages with easy-read text and non-verbal communication skills. Such systems have yet to successfully and seamlessly merge intelligent agents with affective computing.

Our work in progress provides functions to help with non linguistic communication as well as writing skills, such as gesture and symbol comprehension,, spelling, word prediction, syntax and grammar prediction and prompts of phrases extracted from dictionaries, picture banks, and assistive technology. This project explores the interface between human (natural) and computational processes of learning and investigates how interactive technology can be designed to enhance creative, expressive communication. As such, it embraces the cognitive systems remits of both EPSRC and ESRC. Contextual information on the proposers and their research centres can be located at www.uel.ac.uk/ssmcs/research/rix.htm (The Rix Centre), www.smartlab.uk.com (SMARTlab Digital Media Institute) and http://www.uel.ac.uk/scot/ii/ (The School of computing and Technology).

This paper investigates and develops a new form of intelligent interactive learning environment to help users with cognitive disabilities improve their communication skills. In particular, it will help these special users with the key challenge they face in attempting to understand text in general and non-literal language (metaphor, similes, irony, slang) and the implied meaning of written content in particular. Daily topics, imagined scenarios and a playback function will aid clear, meaningful interaction. Zhang et al have previously explored automatic affect detection and topic tracking from open-ended improvisational text in E-drama to monitor user's performances in role play, combining emotion modeling, rule-based reasoning, robust parsing and semantic processing. Palmer-Brown et al have developed connectionist and neural network learning methods (such as Snap-drift) for pattern recognition and feature discovery that have proved effective for on-line user behaviour analysis, speech feature discovery, phrase recognition and parsing. They will be integrated into the affect detection, and topic tracking processes to create an approach that will enable the system to identify whether the user understands context. Moreover, a user emotion model will be employed to monitor user's emotional state based on his/her performance and behaviour patterns recognized during the interaction. The affect detection and emotion modeling will allow frequent and apt feedback to be presented by speech synthesis, visual and textual prompts. The content and presentation format of the conversation will be adjusted according to the detected emotional tone in the user's text input and the user's performance during the interaction.

Co-PIS (in alphabetical order):

Mick Donegan is is the new Principal Research Fellow in Multimodal Interfaces, and the head of a new research group on Interfaces for Assistive Technology & Creativity at the SMARTlab. He has long held the post of Deputy Director of the ACE Centre, Oxford (www.ace-centre.org.uk): a specialist centre for technology to support communication and education for people with severe communication difficulties. He went to The ACE Centre following his responsibility as IT Co-ordinator and Deputy Head Teacher at Wilson Stuart Special School, of one of the country's largest special schools for physically disabled children in the UK. His particular technology and disability-related interests/passions include Speech Recognition, Access to Video Games and Leisure Software, Eye Controlled Technology and Remote Support Technology - areas in which is has specialised over an extended period of time.

Lizbeth Goodman is Director of the SMARTlab Digital Media Institute and Magic Gamelab at UEL. She is also heading up the knowledge exchange events and social networking forum for the UK's Building Sustainable Communities Programme. For NESTA, she is Exec Director of the Legacy Projects in Learning and in the Fellowship Programme for Technological Innovation. She is currently the editor of the new MIT Press series: Emergenc(i)es, focusing on best practices and future inventions in technology serving education and culture. Professor Goodman won the Lifetime Achievement Award for volunteer service to women and children in 2003, and has just been named Microsoft Community Affairs Senior Research Fellow in Creative Technology Innovation.

Dominic Palmer-Brown is Professor of Neural Networks and Associate Head of Department of the School of Computing, UEL. Palmer-Brown is the inventor of several neural network methods for on-line computational learning, pattern recognition and natural language processing on projects supported by BT, EPSRC, UN, and NERC, and he pioneered the use of neural networks for environmental data analysis. He has supervised 12 PhDs to completion, and was selected as editor of the prestigious Elsevier review journal, Trends in Cognitive Sciences (2000-2). An invited contributor to several journals, including Neurocomputing, he is also a keynote speaker at international events, such as the International Conf. on Engineering Applications of Neural Networks.

Li Zhang is Lecturer in Computing (Gaming and E-Drama expert) at UEL. She was the leading research fellow on an E-drama project (Feb 2004 – March 2007) collaboration with University of Birmingham, Hi8us Midlands Ltd, Maverick Television Ltd, and BT, under the ESRC/EPSRC/DTI "PACCIT" programme. The Chairwoman of the funding programme commented that E-drama was the most ambitious and academically deepest of the LINK projects in the current round, and is regarded as highly distinctive in the field in terms of the types of Natural Language Processing employed. Li Zhang is also involved in another EPSRC funded E-drama project related to figurative language processing project, and has published widely in E-drama, and speech and language processing.

Helen Kennedy is a researcher in media and disability at the Rix Centre- a research and user test centre for people with cognitive disabilities, chaired by Lord Rix of Mencap. Helen is the SMARTlab representiave for the Rix Centre: a research unit of the University aimed at researching, creating and testing innovative learning tools and games for people with disabilities. She has a background in the sociology of learning tools, and has worked extensively on media projects linking studies of information and mental processing with hands-on work with learning disabled young people and adults. She is currently co-supervising several SMARTlab PhD students, and is also at work on her new funded Dsign for the 21st Century project with us- this to explore new information maps for people with disabilities. She is widely published and has held a few grants in her own name, and holds the Rix research funds as well.

Wider research team includes Toby Borland, James Brosnan, Clilly Castiglia, and Turlif Vilbrandt.

Doruff, Sher
Extreme Intervals and Sensory Fusions

Two relatively notable areas of neurophysiological research in the late 20th century are of frequent interest to artists and theorists: the half-second lag between brain stimulus and conscious reaction (Libet, Haggard) and the confounding characteristics of synaesthetic cross-sensory fusion (Cytowic, Ramachandran) – hearing colours, tasting shapes, seeing sounds. The topological qualities of human perception, cross-modal sensation, and conscious agency (choice, free will) elicit fascinating implications for art and design practitioners, performing artists and improvisers.

Benjamin Libet's infamous 300millisecond lag between brain event and volition is called *readiness potential* (RP). According to Libet and later researchers, consciousness can only veto actions, an exercise of "free won't", by creating an illusion of real time interaction with the world through 'backward referral'. The Libet gap between brain stimulus, perception and reaction can be construed as an empty ±500ms interval or, more interestingly, as a duration of inestimable potentiality, an overfull interval of infinite contingencies in superposition. In Deleuzian terms it might be likened to the virtual immanence of difference, the event of emerging of multiplicities. *Readiness potential* does for theoretical explorations of thought, what *synaesthesia* research does for imagining the power of sensation. Taken together they can generate a wildly speculative conceptual kick.

One of the five fundamental conditions for pathological synaesthesia is the experience of cross-sensory fusion as "involuntary *and* elicited" (Cytowic), alluding to a nuanced paradox of sensory-stimulated "choice." Cytowic's criteria aids in distinguishing pathological synaesthesia from its metaphorical cousin in which modal sensations are linked or associated for literary, aesthetic or mnemonic advantage. Census-taking of bona fide synaesthetes by neurological and psychological researchers has varied in the past decade from 1-in-20,000 to 1-in-200 with the prospect that cross-modal transfer (CMT) is present in all humans at birth and outgrown or backgrounded as the brain matures (Baron-Cohen; Cytowic). If synaesthesia is indeed a dormant neurological function, then might the pervasive reach of digital cross-media processing, for example in sound/image correspondences in VJ/DJ improvisations and haptic relations via the interface to multi-sensory effects in digital gaming, performative installations, etc., awaken that dormancy through repetitive, ubiquitous modal mapping? The current attention given to synaesthetic experience, pathological and/or metaphorical (synthetic) and the temporal qualifications of 'real time' experience suggests a common interest from science, philosophy and artistic practice to investigate the *event;* the movement of the datum of thought and sensation, of prehensive (Whitehead) processes; to further explore the dynamic territories of memory and intuition; to parse the *eventspace* of the mysterious and controversial interval.

This paper will take a conceptual approach to potential relations between several aspects of "involuntary and elicited" synaesthetic cross-modal referencing in relation to the temporal qualities of non-volitional readiness potential and the movement of thought. A living biogrammatic topology emerges that folds and unfolds experience back into itself (Massumi) in that *extreme*, supersaturated half second. Two main questions will be considered: Does intuition have a sensory correlate? How might cross-sensory relations enabled by 'real time' digital media processing affect this extreme interval?

Sher Doruff, PhD, has worked with digital performance technologies in collaboration with artists and performance-makers since the mid 80's. Her current work is dedicated to an empirical mix of theory and practice broadly situated in the Live Arts genre. She is Head of the Research Programme at Waag Society and lectures/mentors in a practice-led MA programme at the School for the Arts in Amsterdam.

http://www.waag.org/person/sher

Drayson, Hannah
Embarking upon the Colonization of Transcendental Space; Gestalt Biometrics

This paper provides a progress report on a three year (EPSRC funded) transdisciplinary research project based in Transtechnology Research at the University of Plymouth (UK). The work is an attempt to exploit scientific anomalies of conscious and bodily experience, to test the viability of a plurality of approaches to human technologies.

Its focus is on assessing body state relative to stimulus and environment and begins with research into biofeedback technologies such as electrocardiography, galvanic skin response and plethysmography as instrumental realities. The intention is to propose new approaches, resulting in alternative 'images' of body states which might advance a broader enquiry towards the re-colonisation of transcendental space. It is in this space that the subject and object collapse, hence the suggestion of gestalt modes for understanding human states, moving away from the reductive, anatomising and disconnecting practices of western medical understanding.

The research is situated in an intermediate space; between disciplines (philosophy/art/medicine) and epistemologies (empiricism/rationality/transcendentalism) incorporating an instability and intermingling of meaning and intention. It is stimulated by the apparent need for new approaches, such as the study of scientifically impenetrable subjectivity and increasing use of medical technologies in everyday life. The research itself forms part of a creative practice, providing an insulation against scientific scrutiny. The imperative for a plurality of approaches to sensing and determining states of the human body originates in many quarters. Often cited are the experiences of patients of western medicine (the mentally ill and sufferers of ME particular examples) and of doctors and researchers who describe the shortcomings of purely material descriptions of the body. James Lynch articulates this lack poignantly when describing his work to measure patients cardiac responses to human contact in coronary care units in the 1970's.

"Sitting in such units as observers, we could monitor this essential aspect of life... we could literally look into the very heart of human relationships... this remarkable technical capacity also made it clear how limited a scientific view of human relationships really was...There simply is a limit to science." (Lynch, 1999).

Rhetoric of technological progress and replacement (bio-mechanical) or mutation (genetic engineering) of the body compels us to re-assess the body before it is dismissed or changed beyond recognition. Anomalous entities - phantom limbs, telepathy and precognition - found within the realm of the body, but generally dismissed by the biomedical establishment, may indicate forgotten or undiscovered realms of experience and knowledge.

This paper argues that perspectives offered by subjective realities and the phenomenology of medical experience constitute useful pluralities for developing technologically mediated medical realities and images. These may revise mechanistic future scenarios and, on the basis of empirical evidence, will insist that this vision should be incorporated into our models of what humans might become.

Hannah Drayson is an artist and technology researcher based in the South West of England. Following her Degree in Critical Fine Art Practice at Brighton University, Hannah gained an MSc Digital Art and Technology in 2006 at Plymouth University. With an interest in science and technology, and their integration into lived reality, she uses media ranging from web and graphic design to visual performance, video and digital audio production. Her works often propose the tactical possibility of the role of the artist to be that of an experimental subject, seeking to understand the role of subjectivity within scientific and technological world models. Currently she is working towards a PhD within Transtechnology Research, at the University of Plymouth, Faculty of technology. Last year she won EPSRC funded support for the next three years for her project Gestalt Biometrics and their Applications. Through this work, she aims to propose novel methods for physiological and medical monitoring methods. Hannah also creates visual projections and experimental music performance for festival and club events in Europe, the UK, Ireland, and in virtual environments such as SecondLife. She also tours and curates events in association with extreme electronic music collective Wrong Music Crew.

http://www.trans-techresearch.net/

Dunn, David / Crutchfield, James P.
Insects, Trees, and Climate: The Bioaocustic Ecology of Deforestation and Entomogenic Climate Change

Part I: Entomogenic Climate Change
Accumulating observational evidence suggests an intimate connection between rapidly expanding
insect populations, deforestation, and global climate change. We review the evidence, emphasizing the vulnerability of key planetary carbon pools, especially the Earth's forests that link the micro-ecology of insect infestation to climate. We survey current research regimes and insect control strategies, concluding that at present they are insufficient to cope with the problem's present regional scale and its likely future global scale. We propose novel bioacoustic interactions between insects and trees as key drivers of infestation population dynamics and the resulting wide-scale deforestation. The bioacoustic mechanisms suggest new, nontoxic control interventions and detection strategies.

Part Two: The Bioaoustic Ecology of Deforestation
Tree-infesting, fungus-carrying beetles of the weevil sub-families Scolytinae and Platypodinae (Coleoptera, Curculinidae) are amongst the most destructive insects known, capable of staging devastating infestations of forests at huge spatial scales. They are also distinctive for their extraordinary range of behavioral variations, feeding strategies and social organizations. These range from monogamous species that are basic phloem eaters (bark beetles) to sophisticated eusocial agricultural species that propagate and harvest fungus as a primary food source (ambrosia beetles). In between these extremes are an amazing array of species that exhibit almost every variation of genetic inbreeding or outbreeding strategy (monogamy to polygyny to inbreeding to haplodiploidy) and diverse feeding adaptations (phloem, fungi, pith, or seeds). All of these variations of behavior, feeding, and sociality, appear to be correlated to a fairly clear pattern of evolutionary development.

Throughout the diverse evolutionary variations of these beetles, one of the most consistent aspects of their behavioral and anatomical characteristics has been an essential coupling between mechanical and chemical signaling that appears to mediate many other aspects of their behavior and sociality. While the pheromone communication of bark beetles has been studied at great depth, much less is known about their sound communication behavior and associated mechanisms. Recent fieldwork has revealed tree interiors (phloem and cambium layers) to be rich acoustic environments where multiple species of invertebrates can communicate through these substrate layers using an incredibly diverse array of sound producing mechanisms.

Audio examples recorded within the interior of trees will be presented. For examples see:
http://acousticecology.org/dunn/solitsounds.html

Jim Crutchfield is a Professor of Physics at the University of California, Davis. Until recently he was Research Professor at the Santa Fe Institute. Before coming to SFI, he was a Research Physicist in the Physics Department at UC, Berkeley. Crutchfield has worked in the fields of nonlinear dynamics, solid-state physics, astrophysics, fluid mechanics, critical phenomena and phase transitions, chaos, and pattern formation. Current research interests center on computational mechanics, physics of complexity, statistical inference for nonlinear processes, genetic algorithms, evolutionary theory, machine learning, distributed intelligence, and quantum computation. He has published over 100 papers in these areas.

http://naniloa.cse.ucdavis.edu/~chaos/

Composer David Dunn has worked in a wide variety of audio media inclusive of traditional and experimental music, installations for public exhibitions, video and film soundtracks, radio broadcasts, and bioacoustic research. He is President and Program Director of the Art and Science Laboratory and President of the Acoustic Ecology Institute, both in Santa Fe, New Mexico. His compositions and wildlife sound recordings have appeared in hundreds of international forums, concerts, broadcasts, and exhibitions. Besides his multiple books, recordings and soundtracks, he has been anthologized in over 50 journals and books. Dunn was the recipient of the prestigious Alpert Award for Music in 2005.

http://artscilab.org/~david

Endo, Takumi
Phonethica

Project Phonethica is an interdisciplinary art project, which explores the world through the phonetics of language. Combining scientific technology with art Project Phonethica maps out the diversity and similarity of the worlds 6,000 existing languages.

PHONETHICA WEB
The Phonethica Web System can find words from among the world's different languages that sound similar to a given word.

For example, while Japanese and French are vastly different languages, the French expression "Ça va?" meaning, "How are you?" and the Japanese word for mackerel, "saba," actually sound quite similar. In fact, because the structure of human vocal organs varies little from Japanese to French to Kenyan, these types of coincidentally shared sounds occur often. Anyone who speaks more than two languages is probably aware of a few examples of this. And sometimes one finds humor in the extreme disparity in meaning held by words which sound similar. The Phonethica Web System can find such words and relationships from among the world's different languages, by comparing their sounds.

Using the Phonethica Web System, people can dynamically access information related to the specified languages. Such information includes: descriptions explaining the culture, native speakers, environments in which they live, types of food they eat, kinds of songs they sing, history, religion, economic and political situations. Information on grammar, vocabulary, orthography, phonology, writing and numbering systems also will be available.

In this way, facts unknown to us come within our reach, not based on the matching of definitions for different words that we can usually locate in a dictionary, but through words that are phonetically similar by chance.

For instance, you may be inspired to learn about the lives of the Taba-speaking inhabitants of the Molucca region of Indonesia, which you never even knew existed. And the next day, you may want to tell your friends about your discoveries. And if you find the salutations and customs of that region particularly interesting, you and your circle of friends might want to adopt them into your own interactions and create a trend. Eventually someone in the group might be roused to visit that place. And, perhaps even years or decades later, that person may decide to take the plunge and travel there. If we live in a world where one can be provoked by such coincidence, then we can imagine the potential that may still lie therein.

If, in this way, two symbols which previously appeared as unrelated can become connected through their very sound, then this common denominator can create a valuable new interface which potentially could relate all aspects of the Earth to each other. This interface will at first promote an awareness of our diversity which will then, paradoxically, give rise to a quiet consciousness of our being related respectively to one another. The world will secretly but certainly grow conscious of its connectedness and its universality.

CONCLUSION
Project Phonethica represents the possibility of creating an alternative or counter value system in a world, which has become overtly structured and entrenched with fixed systems of meaning. Taking the diversity of mankind as its starting point, it attempts to make a new kind of reference tool, one governed more by chance more than by reason.

Project Phonethica does not aim to protect languages or archive them in libraries. Rather, it endeavours to invent a dynamic method by which we can understand and appreciate our diversity and randomly disseminate it as part of a wider social movement.

Takumi Endo is a Media Artist currently based in Paris//Tokyo. Education: 1994: International Bartok Seminar, Orchestra Conduct Master Class, Szombathely, Hungary/Diploma, 1995: Kunitachi College of Music, Tokyo/Bachelor in Music (Eurythmics). FELLOWSHIPS: 2007: Map XXL–Pepinieres europeennes pour jeunes artistes (EU), 2006: Aschberg Bursaries for Artists (UNESCO). Exploratory Software Project (JPN), 2005: DAAD Berlin (GER), 2004: POLA Art Foundation (JPN), 2003: The City of Paris and The Ministry of Foreign Affairs (FR), 2002: Fellowship Artist of Japan (JPN), 2002: GRAZ2003/Cultural Capital of Europe (AUT). RESIDENCES: 2007: Akropolis Palac/CIANT (CZ), 2005: DAAD Berlin (GER), 2004: Centre des Recollets (FR), 2003: CICV (FRANCE). Sanskriti Foundation (INDIA), 2002: Hull Time Based Arts (UK), 2002: Forum StadtPark (AUT)

http://www.inexhale.net
http://www.phonethica.net
Ferran, Bronac / Ratto, Matt
Artists and Scientists as Extremophiles: Extreme Environments and Ecology

The conference call and associated texts ask us to reflect on extreme environments and the "extremophiles" that inhabit them, understanding such things as indicators and vectors for the mutations that constitute biological change. The goal of our presentation is to extend this concept, to use the language of "mutamorphosis" to link biological, environmental, and cultural

change, and to explore how shifts in the space of the artist studio compare to shifting relations between scientific laboratory and real world.

We start from the position that artist-scientists are themselves extremophiles, in the sense that many of them seek out extreme natural and cultural environments in which to practice their work. Much of this work acknowledges the continuing and increasing “extremity” of the earth, and locates itself with an interventionist perspective – the goal of these artist-scientists is to imagine and actively seek beneficial environmental, ecological, and culture changes. If science looks and observes and art sees and foresees (Naum Gabo, Foreword to Circle, 1937) what can the combining of these disciplines mean in the context of extreme environmental conditions?

We focus on two related forms of “extremity”; that of global climate change and that of poverty. We suggest that addressing both increasingly requires a renegotiation of the distance of art and science from its working out on the ground; a movement of both the studio and the laboratory into the very environments studied, and a collaboration with the organisms and individuals it purports to effect.

We examine two projects in two differing contexts, “The Outlandia Project” in Glen Nevis, Scotland; and “The Human Project” in Sergipe, Brasil. Both projects involve artistic, technological, scientific, and architectural skillsets to engage with environments marked by extreme natural beauty and with the social and economic issues associated with extreme rural environments. Through dialogue and reconstruction of the physical landscape, these projects extend the notions of 'interaction' prominent in current art-sci-tech work to include social, cultural, and ecological engagement with local communities. Importantly, both projects take concepts from "laboratory' environments into 'real world' constructed material situations - and hence detach from an arts or science specialist 'niche' into novel, creative, and productive relationships with a general public.

We see these interventionist and interactive projects as emergent environments where conceptual and theoretical explorations of both art and science become closely coupled in order to materialize new possibilities for living. From the perspective of the conference themes, a new kind of “extreme environment” is opening up, where conjunctions between what might be termed 'high tech/highly specialised' and a 'low tech/diy ethos' become realized. Projects like THP and Outlandia can be seen as social experiments/situated laboratories with all the risk that might be found there. But larger questions and challenges also emerge - about climate change and the potential impact on building in fragile ecosystems, about how traditional notions of 'knowledge' can interplay with imported processes, and how the edges and boundaries of “extreme” spaces are managed, maintained, or created in order to create novel living spaces for the extremophiles we are all increasingly becoming.

People:
Bronac Ferran http://boundaryobject.org, http://iaa.i-dat.org/
Matt Ratto http://www.virtualknowledgestudio.nl/staff/matt-ratto/),
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Projects:
http://www.thehumanproject.org.br
http://www.londonfieldworks.com/new/index.html

Bronac Ferran is a writer, producer and researcher working in the UK and internationally. She was formerly Director of Interdisciplinary Arts at Arts Council England where she initiated numerous projects along the lively borders between art, science, technology, law and ecology.

Matt Ratto is a science and technology theorist who examines how information technologies are involved in the shared processes by which cultures and institutions make sense of the world and simultaneously work to construct and organize it. He is a founding member of the Virtual Knowledge Studio for the Humanities and Social Sciences in Amsterdam and a core member of the bricolabs initiative.

Fischer, Hervé
Law of Divergence and Mythoanalysis of Limits

Darwin's law of natural selection published some 150 years ago proposed a surprising and evidently fundamental discovery and explanation of the Origin of species and their evolution. But this law for sure cannot explain that the human species, which is the most recent of mammals according to experts, has succeeded to mute so quickly and to outrun all other live species thanks to the development of its brain up to the point which we observe today.
Darwin's law and explanation encounter evident limits. As a matter of fact, we observe dramatic ruptures in the history of our human physiology and behaviour. We have to admit the evidence of biological mutations, which occurred in the evolution of the human species, many times more than in any other animal species. We have to acknowledge the evidence of a process of acceleration based on decisive mutations, such as vertical walking or the development of our brain foremost physical strength, wings or sensorial perceptions. And this process of evolution seems to have accelerated. These mutations multiply exponentially since a century, in relation with our demographic shock, and the increase of our instrumental power thanks to technoscience. There is no doubt that nowadays the digital age means an anthropological revolution or mutation. Only the Law of divergence, which we propose to consider, may reflect such radical mutations. The human being is not limited to adaptation. He thinks and develops projects, considers dangerous utopias, which may even put him and the whole planet at risk. He tries to escape any determination. We just have to evocate the history of science, technology, religions and even politics to be obliged to admit the evidence of the Law of divergence. He is crating himself by rejecting admitted evidences, he diverges, he projects and he proclaims that *an other world is possible*. Art history is a history of divergence proclaimed by audacious creators confronted to the risk of failure, social reprobation and even madness. Only the Law of divergence may tell us of the history of science, founded on a succession of dialectic negations of its established truths, which have allowed it to progress. The human being is able to invent ideas, to conceive hypothesis, to mute. This Law could be formulated as such (1):

Law of Divergence:
Changing is not created by the point of view of passive majorities, but on the contrary, by the alternative projects of minorities or atypical active individuals.
In the same way, the collective memory does not preserve foremost widespread productions, but on the contrary the very rare.
Finally the exception always tends to prevail and impose its new law.
How do we explain that the exception usually is more determinant that the majority? We have first to admit that it does not happen so often, but it is the only and very factor of change.

Mythoanalysis of Limits
As a result we must here rehabilitate the power of imagination, its creative power, which allow us to transgress the limits of religious beliefs and even of rationalism (postrationalism), enabling us to create new visions of life, of the universe, and even of ethics and our social values and institutions. Therefore it appears necessary to question the nature of these limits.

Do we encounter there limits of our nature – which may however be very relative – or mythical limits, linked to extreme fantasies such as those of Babel Tower, and which we may call *li-myths*. We have to consider this question.
Mythoanalysis consists in the analysis of those myths, which structure our social imaginaries, and allow the metaphoric evocation of images in our languages, our artistic and scientific theories, styles and visualizations.
Admitting the Law of divergence, we feel more confident to explore the mutations which have made the human species what it is today.
Those who explore chaos are not mad: they look for new cosmos.
What de we dream of beneath extreme and hostile limits? We dram of assuming and acknowledging our very nature of human gods. And in reality, what could we dram of, if God does not exist?

(1) See : Hervé Fischer, La société sur le divan, éléments de mythanalyse, éditions vlb, Montréal, 2007.
(2) See : Hervé Fischer, CyberProméthée, l'instinct de puissance à l'âge du numérique, éditions vlb, 2003.
(3) See : Hervé Fischer, Nous serons des dieux (vlb, 2006).

Hervé Fischer is a multimedia artist and philosopher. The Venice Biennial 1976, special guest at the Sao Paulo Biennial 1981, Documenta, Kassel 1977, 1982. Personal exhibitions at the Musée Galliéra, Paris 1976, MAC of Montreal, 1980, MAC of Mexico, 1983, MBNA of Buenos Aires 2003, Montevideo 2004, Santiago 2006, Pinacoteca, Chili 2007. Founder of La Cité des arts et des nouvelles technologies de Montréal (annual exhibition and computer animation competition Images du Futur 1986-97, the Téléscience Festival 1990, the Multimedia International Market, 1992 ; co-founder and president of Science Pour Tous, Quebec, since 1998. He was honoured with the first Leonardo Makepeace Tsao Award. Professor at Sorbonne/Paris V, Daniel Langlois Chair for digital arts, Concordia University, Montreal, 200-2002; now associate professor at UQÀM, initiating an International Digital Observatory. He has published many books.

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Germen, Murat / Ayiter, Elif
Looking Aside: Collective Constructs, Autarchic Assemblage

Keywords: Web 2, visualisation, photography, education, associative structures, self organisation, tagging, tag clouds, complexity, connectivity, collective intelligence, system,

Photography communities emerge as complex systems that seem to have engendered the creation of a particular form of associative content through the usage of tags and tag clouds, manifesting as powerful textual structures that nonetheless take their trajectory from the visual. Thus the single photograph is no longer an independent visual entity, but becomes part of a self organising system [1] which is capable of manifesting expressive, narrative and interpretative abilities, as the materialisation of a non-sequential/non-linear, if not indeed multi-linear collective intelligence.

"… the photograph is violent: Not because it shows violent things, but because on each occasion it fills the sight by force, and because in it nothing can be refused or transformed." [2]

Web 2 photography domains simultaneously project an equally powerful capacity for individuated expression which, at first glance seems to present a contradiction to their prevalent "communal" characteristic: These photographs are mostly posted by amateurs and, as such, they rarely possess any of the glamour and intentionality / instrumentality present in professional photography; be it stock, advertising, journalistic or otherwise. As such, they bring to the fore the usage of photography as a tool of personal expression which, borrowing Lewis Mumford's phrases on the aesthetics of the ordinary, can be considered as the "elimination of the non-essential" that foregrounds "the naked quality of the material itself". Thus, Web 2 domains allow room for an idiosyncratic, non-customized photography genre which necessitates the discourse of an "aesthetics of the ordinary", as opposed to the ubiquitous and recursive aesthetics that prevail in professional stock photography.

Information and Communications Technologies are in the process of going a long way in creating extreme environments for art education, indeed they seem to herald the implementation of innovative, e-educational, cybernetic systems for the dissemination of, not only creative activity itself – as is the case already; but also for the education of creativity in the imminent future. Thus, this paper describes a proposed electronic, art educational syllabus/methodology focusing primarily on, but not limited to Web 2 communal photography; one which aspires to translate Arthur Koestler's definition of creativity as a process of "thinking aside" [3], into an educational approach which can be characterised as "looking aside"; of which, associative content, materialising as a confluence of text and image; as well as the layering and clustering of images, ideas and concepts into complex creative structures/systems are envisioned as the basic building blocks.

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Germen has BS degree in city planning from Istanbul Technical Univ., MArch degree from MIT, where he went as a Fulbright scholar, received AIA Henry Adams Gold Medal for academic excellence. Works as professor of photography and multimedia at Sabanci University, Istanbul. Has submitted work for distinguished inter/national institutions like Young&Rubicam, McCann Erickson, The Designory, DDB, Aga Khan Architectural Awards, Siemens, Istanbul Modern, etc. Having been widely published in magazines and books; he was invited to several symposia, conferences like SIGGRAPH, eCAADe. Has opened over 20 inter/national exhibitions. Has received inter/national awards for work on photography (like IPA), design, architecture. Has been invited as jury member for eminent national photography competitions.

http://www.citrinitas.com/
http://www.muratgermen.com/

Goodman, Lizbeth / Duffy, Brian / Sudol, Jeremi / Price, Marc et al.
TRUST: Robotics and Haptics for Extreme Interaction and Universal Design

Keywords: Haptics, gaming, rehabilitation.

This paper will chronicle the past five years of research and practice engaged in by the Trust Project Team, most recently working on site at the Stephen Hawking School for children and young people with complex multiple disabilities. TRUST is a project developed by Lizbeth Goodman and the SMARTlab team, which seeks to offer young people with limited physical ability to engage in rich 3d imaginative environments that encourage relaxation and healing. It has to date been tested in various iterations in the Montefiore Hospital for Children (Bronx, New York), The CRC (Central Remedial Clinic Dublin), the KK Hospital for Children (with NTU Gamelab, Singapore) and the Stephen Hawking School, London.

1 Background to the Project

In recent years, children's hospitals worldwide have investigated using aspects of video games and other media tools available to young patients to address such problems as isolation, stress management, and rehabilitation. Online communities represent a novel solution to the problems of isolation, for example, for children in hospital care. The majority of such network interactions are generally text-based, utilising chat and forum clients such as StarBright Web and the Cystic Fibrosis Teams Initiative. There is a growing body of evidence suggesting that these communities, despite being limited to text interfaces, can improve pain scores and may improve depressive symptoms, reduce anxiety, and raise self-esteem.

While the use of interactive digital entertainment, or video games, in hospital settings is not new, studies performed to test more graphical interfaces show a similar potential for gaming networks. The work of Bers et al. examined the use of a three-dimensional graphical virtual city, Zora, which provided the setting for a pilot group of hemodialysis patients to socialize in the same network space and to interact via their avatars. This and similar work demonstrates the potential of virtual gaming as a means to escape from difficulties afforded by their situation in hospital settings. The work of Hoffman et al. also details the use of virtual environments in reducing pain scores when employed as an adjunct to pharmacotherapy for patients with burn and dental pain.

2 TRUST Objectives

The objectives of the TRUST Project is to develop game-based interactive play in order to aid in children rehabilitation and ease the stresses associated with hospital scenarios. The play environment is designed to be inclusive, i.e. not solely for able-bodied and able-minded people. The virtual environments and game scenarios have been tailored to an audience of 8 to 13 year old children with varying degrees of abilities. TRUST seeks to offer more than distraction, but also a tool for collaboration and connection from the isolating environment of the hospital, and a tool for studying the impact of cooperative game-play on physical, emotional and rehabilitation (http://www.give-trust.org).

To address these objectives, the TRUST framework has integrated several modes of artistic and technological innovation; a game engine and associated software framework and a pneumatically operated, active chair which provides a closed loop haptic interface that is synchronised and congruent with the game play. In addition, an array of joysticks allows users with constrained mobility to interact with the system. The following sections outline the technological innovation that has been developed and is being currently installed in the KK Women & Children's Hospital in Singapore.

In closing, the paper discusses the HOPE Project (Hospital-based Online Persistent Paediatric Environment) which commissioned the team to invent the first version of the bespoke TRUST game for young people in hospital, and which runs to date as a network of medical doctors using gaming in teaching and rehabilitation.

Acknowledgements:
The TRUST Project team would like to thank the Stephen Hawking School and Science Museum London, and also NESTA (the National Foundation for Science Technology and Arts) for the financial support offered for the latest project phase in 2006-7, and BBC R&D, the GameLab at Nanyang Technical University, Singapore, and also to James Brosnan (Central Remedial Clinic, Dublin) for support in 2004-6. The Carl Sagan Trust and Children's Healthy Fund and the Motion Capture/Movement Lab at NYU funded the first phases of this research in 2002-, with assistance form Lego Europe and private donors. Thanks also to Dr Arun Mathews (HOPE project lead, Johns Hopkins Med) for help with background research.

http://www.give-trust.org
http://www.hopeconnectskids.org
(http://www.hopeconnectskids.org/hopeconspirators.html)
http://www.smartlab.uk.com

Co-PIS (in alphabetical order)

Brian Duffy is co-PI of the Trust Project (with Goodman, Price and Sudol). He is currently Researcher with SAP (France) and also an Associate Senior Researcher with SMARTlab. He has been actively involved in research in many international academic and non-academic institutions throughout Europe in the fields of robotics, artificial intelligence and haptics for over 14 years. Currently, Brian is a Research Engineer at the Institut Eurecom, Sophia Antipolis, France. Previously, Brian conducted postdoctoral research at University College Dublin (UCD), directed the Anthropos Group at Media Lab Europe, and research for GMD, Germany and INSA de Lyon, France. Brian has a Masters of Engineering Science, a Bachelor of Science in Production Engineering, is a member of the IEEE, a Chartered Engineer, and holds the Eur.Ing qualification.

Lizbeth Goodman is Director of the SMARTlab Digital Media Institute and Magic Gamelab at UEL. She is also Director of Studies for the UEL practice-based PhD programme in Digital Media & Informatics: a cohort of 32 professional new media artists and engineers conducting collaborative research into the transdisciplinary fields of technology development and art, e-health, e-inclusion, haptics and 'artsci'. Her main field of speciality is the creation of learning games developed WITH, not only for, people with disabilities and 'non-standard gamers'. She is also heading up the knowledge exchange events and social networking forum for the UK's Building Sustainable Communities Programme. Lizbeth is the author and editor of some 13 books including a range of titles on best practices in media and technology tools creation, the implementation of live and online theatre games, women and theatre, the arts, representation and creativity.

Marc Price is Senior Engineer/Researcher at BBC R&D, where he specializes in screen systems for audience empowerment. As part of his research and our ongoing collaboration with the BBC, Marc worked with us on site in London, Dublin and Singapore in 2004-5. In 2006, he brought us a new collaborative project in Somatics: using Tai Chi as a physical game interface wherein the 'meditator is the interface'. This project will run from SMARTlab and selected schools and community centres in East London from 2006-9.

Jeremi Sudol (co-PI Trust) is interested in developing technologies that celebrate the human spirit. He's been involved in a variety of projects in active technologies, experimental human-user interfaces, performing and visual arts, and artificial intelligence. As Co-PI on the Trust Project, he is researching sensors and multimodal interfaces for children's interactions with games and technology devices. He has worked with us in Dublin, New York, Los Angeles, Singapore, and now on site In London for the Trust Project for complex multiple disability, on site at the Stephen Hawking School, East London.

With

James Brosnan is the SMARTlab's Associate Research Fellow in Assistive Technology Innovation. He has worked with us on the Trust Project, StreetscalledHome, Guinevere's Globe, Fellicean, and a number of major externally funded projects since 2003. He is also an author and activist in the domain of disability and widening participation through technology. He is also a key member of IBM's user testing research lab. James Brosnan works as a journalist in the Forum of People with Disabilities Dublin, which plans to launch a Newszine in 2007 for the Forum's 15th anniversary. He is also a lead tester for IBM Europe's disability interfaces research.

Clilly Castiglia is SMARTlab's Director of Operations and Development, as well as a researcher in the areas of sonic design/music and assistive technologies. Before Joining SMARTlab, Clilly Castiglia was the Senior Vice President and CoFounder of Technology Developers LLC. Her role is to oversee the Design and Production of new technology and experience based projects. Prior to starting this company she was the Director of Operations and Development at The NYU Center for Advanced Technology/NYU Media Research Lab. There she managed the development of technologies in the areas of collaborative tools and environments, new interfaces and input methods for wireless and handheld devices, Tangible media, High-end Graphics and Real-time animation. As an Associate Researcher at the SMARTlab UK she was involved in the VIP project (Virtual Interactive Puppetry): system that allows live performers and Virtual Puppets to work and perform remotely and in 3D.

Jana Riedel is the Trust Project Manager. As a talented Digital Artist and Filmmaker, Jana contributes her skills in media arts and digital editing technologies, as well as her talent as a filmmaker and documentary artist, to the work of the MAGIC team. Jana is responsible for the creation of the visual content and archiving of all the SMARTlab's projects, and holds the 'human memory' of many of our largest and most complex (and successful) international collaborations. She worked closely with our team and did the majority of the documenting of the Clubtech Project for disadvantaged children, traveling across the USA (into many of the poorest neighborhoods, with the richest stories to tell) throughout 2004-5.

Goto, Suguru
Virtual Musical Instrument and RoboticMusic

Keywords: Robot, Gesture Controller, Humanoid Robot, Artificial Intelligence, Interaction

I am composer, which uses the new technology in a field of music. My work is based on the composition with visual and performance aspects. In order to do this, I newly develop a system each time. “Virtual Musical Instrument" and "RoboticMusic" are the systems, and these are already applied to the performance work.

First of all, I would like to briefly explain the definition about the Virtual Musical Instrument. Then, I will explain one of the development, “SuperPolm”, and another “BodySuit”. “RoboticMusic” is not within the definition of Virtual Musical Instrument, but the consequence of it. Therefore, it makes sense to me to derive these in this order. Finally, “Augmented Body and Virtual Body” is the title of work, in which “BodySuit” and “RoboticMusic” are applied to the performance work.

I experimented with numerous compositions and performances with these systems. This paper is intended to report my experiences, as well as their development, concept and the applications to the works.

The following is a brief chronological order of my recent works:
The Virtual Violin, the "SuperPolm," was built in 1996. The SuperPolm was created with the collaboration, Patrice Pierrot and Alain Terrier in Ircam, France. It was originally intended to complete a piece I composed for Ircam in 1995 - 1996. It is based upon the idea of short-range motion capture, such as finger, hand and arm movements. The signals are translated into MIDI signals so as to control generated sound in real time.

The "BodySuit" was built between 1997 and 1999. It is intended to be a motion capture for the entire body. Although a performer wears the "BodySuit," this does not mean that he merely controls a physical instrument. Therefore, a performer merely produces sounds with his gestures by bending and stretching each joint.

“RoboticMusic” was created in 2003. RoboticMusic consists of an ensemble of five percussion robots: a gong, bass drum, tom-toms, snare drum with cymbal and a pipe.

This project “Augmented Body and Virtual Body” originally started in 2002. In “Augmented Body and Virtual Body”, this system is intensively experimented with and was shown on several occasions during 2005. The last performance was realized in, “Le Cube,” in France in April 2006.

Suguru Goto is a composer/performer, an inventor and a multimedia artist and he is considered one of the most innovative and the mouthpiece of a new generation of Japanese artists. He is highly connected to technical experimentation in the artistic field and to the extension of the existing potentialities in the relation man-machine. In his works the new technologies mix up in interactive installations and experimental performances; he is the one who invented the so called virtual music instruments, able to create an interface for the communication between human movements and the computer, where sound and video image are controlled by virtual music instruments in real-time through computers. Lately, he has been creating the robots, which perform acoustic instruments, and he is gradually constructing a robot orchestra. He has been internationally active and has received numerous prizes and fellowships, such as Koussevitzky Prize, BSO fellowships, the first prize at the Marzena, Berliner Kompositionaufträge, a prize by the IMC International Rostrum of Composers in UNESCO, Paris, DIRECAM, French Cultural Minister, and so on. His works have been performed in major festivals, such as Resonaces/IRCAM, Sonar, CICV-Les Nuits Savoueuses, ICC, Electrofolie, Haus der Kultures der Welt - Haimat Kunst, ISEA2002, NIME 2004/2005/2006, Olhares-Outono, Ressonancias, Audiovisionen, Utopiales Festival, AV Festival, and Mixed Media Festival etc. In 1995, his first opera "NADA (Media Opera)" was performed in Shauspielhaus, Berlin. At the same year, he moved to Paris in order to realize a project at IRCAM, Paris. In 1996, his "VirtualAERI" was given the first performance at Espace de projection, IRCAM. In 1998, he was invited to perform at Sonar, Barcelona. In 1999, he was invited to perform at ICC in Tokyo. In 2003, his concert was given at Pompidou Center, in Paris. In 2006, his “RoboticMusic” was commissioned by AV Festival in Newcastle, England and was enthusiastically received by the large public, as well as the mass medias. He has been producing computer music and researching at the group "Gestural Controller" in IRCAM, Paris since 1995. Lately, he has been working for Brass instrument robots with Artificial Mouth at IRCAM, as well. Goto's works have been shown in Canada, England, Germany, France, Italy, Portugal, Spain, Slovenia, Ukraine, Japan, and U.S.A. His works are published by "Edition Wandelweiser GmbH"(Germany). His "Giseion to Gousei" is recorded on CD, which is available from Akademie der Künste label (Germany) and his "Temps tressé III" from ALM Records (Japan).

http://suguru.goto.free.fr

Grond, Florian
From Reality to a Line and Back, a Little Theory of Everything

We think that reality represents itself as a fragment or even exists as such. Etymologically the mathematical notion of a fractal shares similarities with the fragment. Whilst the fragment always represents a part of the whole, some fractals, namely space filling curves (SFC), have the capacity to rearrange orderly everything they map in lower dimensions. This quality is of particular importance for modern computer science, were key issues are parallelization of processes and organization of complex content for quick access in databases [Zimmermann 2001]. SFCs were invented by Giuseppe Peano in 1890 and one year later also found by David Hilbert. Although SFCs were at their beginning purely of mathematical and academic interest, the Russian philosopher and mathematician Pawel Florenski linked his insights about SFCs very early with questions of image theory drawn from the fine arts. He develops this idea in his essay “The Reversed Perspective” (1919), one of his best known writings outside Russia. In this essay he investigates if there is a true or at least particularly valid way to grasp reality in an image. He starts his intriguing ideas from his profound mathematical background analyzing the mapping properties of Hilbert’s SFC. Interestingly, Kazimir Malevich, also expresses similar ideas at the same time by referring to literature without explicitly drawing links with mathematics. Malevich is mostly concerned with the relation of shapes and forms, when they are translated from a visual medium, an image, to the sequential or linear realm of language. Without mathematical foundations, Malevich is very much aware of the necessity to break the forms when reducing the dimensionality of media, and comes with his ideas close to the notion of fractal dust. Of course he was not the last to reflect on this very fundamental question. Some decades later, similar lines of thoughts can be found in the work of Italo Calvino, more precisely in his legacy the book “six memos for the next millennium”. He is also unaware of the mathematical foundations mentioned by Florenski and therefore approaches the topic intuitively. Yet Calvino links the inherent properties of text and image and their relations to each other in a manner that is convincingly reminiscent of Hilbert’s space filling curve construction. The Hilbert line fractal taken as a metaphor for the understanding of the text-image relation can, on closer examination, serve as an interesting frame for the use of language in a sceptical or deconstructivistic manner vis-à-vis conventional stylistic devices. Today SFCs are more and more involved in computer science to address technological questions. I recently took advantage of their structure to develop methods in the field of scientific sonifications. Wherever they are applied, their purpose is to translate from complex high dimensional realities to sequential or linear processes and. I want to use the above mentioned backgrounds from arts and philosophy to link it with today’s use of space filling curves in computer science and media arts. Quoting Niels Bohr, from Don Foresta’s text, I will use SFC’s to describe "the relations between the manifold aspects of our experience". I want to illustrate our relations to media of different dimensions, that is to say, differently represented realities.

Florian Grond studied Chemistry in Graz, Leicester, Tübingen. Since 2001 he works at the ZKM (Center for art and Media in Karlsruhe) in Germany. His interests lie between science (non linear dynamics, system theory) and media art, resulting in journal publications and installations. He exhibited so far in Austria (Graz), Spain (Madrid), Germany (Karlsruhe, Cologne), Denmark (Esbjerg), Switzerland (Aarau) and Japan (Hakodate, Tokyo). His recent project at the “Institute for music and acoustic” at the ZKM focuses on the field of scientific sonification, a discipline that deals with the acoustic display of data as a scientific method. This project is part of his PhD “sonification of macromolecules” at Bielefeld University.

http://www.grond.at/

Harris, Yolande
Taking Soundings: a Sound-Artists Investigation into Technologies of Coastal Navigation

Taking Soundings places musical composition and sound art in a space of navigation and landscape. It suggests that technologies of navigation contribute to forming our relationship to the natural environment. Through the media of sound, moving image and space, the research contemplates artistic implications of navigation in a technological position of motion, instability and noise. This empirical approach highlights the contrasts between a bodily experience of a physical environment and accumulative technologies of invisibility and intangibility. Sound, in the meeting of its physical and musical guises, is the primary catalyst.

A coastline is the environmental meeting of land, sea and sky, an area of perpetual dynamism between liquid, solid and air. As a landscape of noise, this sonic interface between land and sea carries ideas of motion, migration, and orientation. While coastlines are usually seen from dry land, the viewpoint and physiological experience of water, felt from a boat, plays an essential part in the understanding of the meeting line. Historical technologies of navigation at sea include: estimating position from sun and stars using a sextant, lowering a lead and line to take-soundings of the (invisible) sea-bed, the (visible) rotating flashing patterns of the lighthouses and the (audible) signals of their foghorns, the (visualised) scanning of radar, and most recently the adherence to an (invisible) satellite system. All offer variations on the perception of movement and location, changing ideas of viewpoint, forming an accumulative set of navigation skills and techniques.

Navigation, like improvisation, does not automatically imply an end goal. Navigating is the act of collecting points of data strung into lines to create traces (past) and trajectories (future) by inferring ones location from motion. Depending on the technique of navigation this may be motion from the stars, from moving points of light beacons, or from orbiting satellites. Positioning oneself in motion through time and space are also the dynamics of the composition of sound and the improvisation of music.

Based on these ideas, Taking Soundings is a series of sound installation and performance pieces that grew out of an artistic research fellowship during 2006 at the Academy of Media Arts in Cologne. The work introduces accumulative techniques of navigation, and contrasts lighthouse and satellite navigation as two different concepts of orientation through space. A comparison of maps, nautical charts and musical scores raises questions as to the (musical) status of a GPS trace. Spatialisation, orientation and mapping are incorporated into the compositional decisions of the sound installation. A mobile version of the performance by car provokes a potential direction of creating music by one's position within a grid of moving satellites. Finally an installation version sounding the movement created by the inconsistencies of a live satellite receiver fixed in the space, challenges assumptions of motion, location and navigation by revealing the apparent motion of the GPS. Ongoing research uses specific sites as examples including the Isle d'Ouessant France, Sydney Harbour Australia, and the Balearic Islands Spain.

http://www.yolandeharris.net
http://www.yolandeharris.net/takingsoundings.htm
http://www.khm.de/kmw/klanglabor/

Yolande Harris has a background in music (piano, flute and composition, BA Dartington College of the Arts, 1997), moving image and architecture (MPhil, Cambridge University 2000). Her artistic work consists of (commissioned) musical compositions, performances and installations exploring a variety of technologies to establish a relationship between the media of sound, video and space. She has held various artist-in-residence positions (Nau Coclea, Spain 2001, STEIM Amsterdam 2002, Jan van Eyck Academy, 2003-2005, Fellowship at the KHM Cologne 2006) as well as working independently. As an academic and a writer she has published in scientific journals, conferences and books, particularly on the expanded spatial and technological implications for scores and instruments.

Harrison, Dew / Rauch, Barbara
The Art of Creating Moments of Stillness in a Volatile World

Modern life on a planet in turmoil is a challenging experience. The effects of globalisation and climate change are directly impacting on our everyday activities and driving our lifestyle. We are surrounded with doom-laden information and are constantly interrupted in our flow of thought by invasive interruptions from our social media. Such hectic living causes stress and depression, which is materialising in strange ways, over-eating and compulsive consumerism. The speed of information accelerates our worries and urges the need to escape from modern living into a space of stillness, the eye of this hurricane, where we can reflect and come to terms with our lives. To what extent can new technology accommodate this?

Digital media and new technology is reconfiguring our relationship with the world and is also affecting how artists relate with their public. Now, new locative technology can position art in the everyday of people's lives and activities outside the gallery space. Although psychogeography and mobile media enable the 'interactive city' for artists to key into, they also promote ideas of corporatised play in an urban space and tend to be interventionist and intrusive. 'Big brother' media and cctv surveillance allows for few informal, ungoverned social meeting places. This means that artists are having to find interstices between the formal constructed and observed social spaces where unorthodox art can happen to engage with its audience.

As artists we are exploring the notion of the 'daydream' as a conceptually suspended duration of time, a liminal space at the threshold between consciousness and unconsciousness. A stillness of being, an interruption in our daily life flow of focussed activity that can be paralleled with Virilio's 'moment of inertia'. Contemporary understandings within our separate interests of dreaming and the rational mind have enabled us to meld these binary mindstates via the interim position of the 'daydream', in which one is neither awake nor asleep. We see daydreaming as the dovetailing of dreams and real-take into an holistic understanding of a compound thought arena. We would like to put it to you that the daydream is a 'stillness of duration' and argue that it could be a necessary and positive attribute to modern life in our technocratic culture.

This paper will particularly concern Virilio's 'picnoleptic' state of interaction, which subsumes the cognitive subject within new media technology and content, producing a form of techno-daydream in an active mind. It will also proffer an in depth view of the actively dreaming mind of the inert, still, sleeping body. With a focus on the two distinct forms of sleep, hypnopomp and hypnagog, bridges will be made between the wakeful and the dreaming brain, also suggesting that we naturally undergo several sleep-awake cycles throughout the day. Paradoxically, Virilio's work on speed + technology = inertia suggests that heightened physical activity at the computer interface can induce a dream-like state or 'absence' from that physicality, while research into dreaming shows that the resting, immobile body of the sleeping person activates the dream state of dynamic free-form thought.

Dew Harrison is a practicing artist and a Reader in Digital Media at the School of Art & Design, Wolverhampton University. She is engaged in research-led practice where she works with thought trails and the conscious mind. Her earlier pieces were multimedia explorations into the creative thinking of Marcel Duchamp as the initiator of Conceptual practice. Current practice concerns the ‚flocking' of thoughts into debates around artworld issues in collaboration with the Macaulay Institute's Virtual Landscape Theatre.

Barbara Rauch is also a Research Fellow engaged in research-led practice. She has recently completed a practice-led exploration of dreaming and online virtual environments. Her interest lies in the neuroscientific model of the unconscious brain and the non-lineartity apparent within dreaming narratives. She is currently working on a project concerned with animal and human facial expressions, drawing on 3D laser scanning devices.

http://www.graysartschoolresearch.co.uk
http://www.pva.org.uk

Hessels, Scott
The Machines above us: an Overview of the ‘Celestial Mechanics’ New Media Artwork

At any given moment, there can be 30,000 manmade objects in the sky above us: planes, helicopters, satellites, weather balloons, space debris, and other diverse technologies. They watch, they guide, they protect, they communicate, they transport, they predict, they look out into the stars. In less than 100 years, the deep blue has become a complex web of machinery and an emergent system of technology.

Our lives are closely tied to these networks in the sky, but a disjunction has occurred between us and the aerial technologies we use every day. We rarely consider the hulking, physical machines that have now become core to our lifestyle. By not being aware of the hardware we use every day, we may also not be aware of the social, economic, cultural, and political importance of these technologies. By visualizing them, it may lead to a better understanding of the forces that are shaping our future.

Celestial Mechanics is a planetarium-based artwork installation that visualizes the paths, patterns, and behaviors of manmade aerial technologies—a graphic display of the paths and functions of the machines hovering, flying, and drifting above our planet. The artwork uses accurate tracking and protocol data from dozens of government agencies and science organizations including NASA, the Federal Aviation Administration, the LAPD, News Organizations, private satellite companies, and web-based user groups.

The statistical data was transferred into 3-d modeling systems and manipulated via programming and compositing. Each technology was visualized aesthetically by a team of designers at UCLA to reflect its behaviors, use, and journey. The result is a night sky program for planetarium that does not show stars and planets, but the new constellations, and in a sense the new mythology, that man has created by the haphazard collection of machines placed in the sky above us.

However, our understanding of this mechanical chaos is so closely tied to the scale of it all—beyond global—that visualization proves limiting. Computers can now collect massive amounts of data, but our display systems are struggling to keep up. Scale is part of information, yet we continue to reduce and enlarge everything in our increasingly well-documented world to 720x540 pixels. Our glowing screens cannot present any of the phenomenology of the data... that awe that scale inspires. Planetariums give us a way to visualize a complex system without losing the emotion of the data. Scale creates wonder, and we should not separate our feelings from the statistics...they help us understand them.

“Celestial Mechanics” mixes science, statistical display, and contemporary art by interpreting the mechanical patterns and behaviors of these systems as culturally significant poetics.

Scott Hessels is a media artist and independent filmmaker who has released art and commercial projects in several different media including film, video, web, music, broadcast, print, and performance. Producing under the name Damaged Californians, his films and videos have shown in hundreds of international film and new media festivals, on television, and in contemporary art galleries over the past 20 years. More recently, Scott has been experimenting with the cinematic form and his recent artworks have mixed film with sensors, robotics, GPS systems, and alternative forms of interactivity. Previously teaching in the Design | Media Arts department at UCLA, he is now at the new School of Art, Design and Media at Nanyang Technological University in Singapore.

Horáková, Jana
Performing Spaces for Cybernetics Organisms

„[T]he machines don't explain anything, you have to analyze the collective arrangements of which machines are just one component.“ (Deleuze, 1995)

The paper concentrates on ideas, hopes and techniques which are/were connected to the term feedback in the field of artistic creativity.

Cybernetics metaphor of feedback leads toward popular figure of Cyborg. In a Cyborg discourse a feedback notion typically functions in a way of an adaptation of human organism to its environment (data-space). Consequently, the terminal figure of cybernetic organism, perfectly adapted to the data-environment, would be pure "human information" (Wiener).

In this paper we rather deal with a notion of feedback as a metaphor that binds men and machines in one space-time context, that works as a border-space in which humanity and mechanical life meet and encounter, and in which a possibility to overstep and remove the boundary line between them takes place at the same time.

This concept of feedback as a spatial metaphor (in opposite to the Cyborg metaphor connected with reimaging of human body/subject) is connected with notion of emergence on a machine side and with a concept of transgression on a side of human performers and/or an audience. We see concept of transgression in a human-machine performances as a kind of “human-effect” that is able to animate machine motions as well as to prepare conditions for possible transgression of an anthropocentrism on a side of human audience (rather on a conceptual level than on a biological one).

This way of understanding of human-machine relationship corresponds with an organization of theatrical space (in a contrary to gallery or public space). Theatrical space we can understand as a stage-space and as a stage-auditorium space:

Theatrical reality on a stage-space has statute of an illusion or a fiction that indicates, evokes and suggests something, but not strictly embodies it. From a semiotics perspective, theatrical performance is considered as means to transform ‘reality’ into sign-systems and/or into a play. Both man and machine put on the stage are thus partly dematerialized and conceptualized and works as an equal parts of the sign system opened for different combinations and interpretations.

Moreover, the stage-auditorium situation of theatrical performance enables us to stage this complicated and complex relationship in its different resemblances, because in its` very ground plan (or mise en scene) is encoded coexistence of two opposed spaces - a stage and an auditorium - which constitute single situation – a situation of theatre. These places are defined by their borderline that both divide and connect them: the borderline between an illusive space (space of an action and re-presentation) and a space of reception, projection and interpretation.

If we would come back to the Cyborg metaphor in its spatial meaning, than in a case of machine assemblages staged in a theatre space, we could understand whole situation as a certain kind of a “cybernetic organism”, constituted from both human and machine systems. The whole situation can be seen then as a metaphor or model of one important cultural interface - interface between men and machines.

In this contribution, we are interested in artistic embodiments of feedback metaphor, which stays in its primordial heterogeneity and plays with human-machine interaction in way of "cybernetic serendipity”. We would like to introduce different examples and strategies of human-machine interaction from a media art history and presence that deals with a remarked concept of feedback in different ways. Playgrounds of these feedback loops are different performances that include human groupings and IT assemblages: from an early computer art, E.A.T and Nine Evenings to Robotic performances (as kind of an art of a “real artificial life”).

Jana Horakova, PhD. teaches and works as a guarantee of an Interactive media studies program at Department of Musicology (Masaryk University, Faculty of Arts, A. Novaka 1, Brno, Czech Republic). She has taken part at different international conferences (e.g EMCSR Vienna 2004 and 2006; ALIFE IX, Boston 2004; Czech-Argentine Biennale Workshop e-Golems, Prague 2005; Entermultimediale2, Prague 2005.). She hed lectures at The National Academy of Fine Arts, Oslo 2005 and at Media Studies dept. University of Lapland, Finland 2005.). She organized Czech-German symposium Media-Performance: fusion of imaginary spaces (Goethe-Institut in Prague 2005). She publishes in specialized magazines and conference collections. Subject of her interest, research and teaching is an archeology and theory of media art with a focus on the field of media-performance relationship and Robotic Art.

Ingham, Karen
The Inverted Eye: a Transdisciplinary Gaze into the Dysfunctional Mind

Rene Descartes, when writing on optics and consciousness, (*La Dioptrique* 1637) instructed the reader to take a dead eye from a recently deceased body and use the eye as the lens for a camera obscura. In his misguided search for the 'seat of the soul' (which he deduced was in the pineal gland) he spoke of looking into 'the mind's eye', in Descartes' time impossible, but now thanks to fMRI scanners and confocal microscopy, a reality. The 'Cartesian Theatre' (though not conceived by Descartes himself) offers us the spectacle of the mind as a darkened theatre where we may search for 'the self', (Doy 2005) but the self is an elusive spectre, and neurologists now know that the self is not constant but is in a state of continuous neurobiological flux. Medical imaging technology looks ever inward in search of the absolute truths that science seeks to answer, the eye of the lens inverted, the mass of the brain seen through the 'astro gaze' (Kember 1998) of the medical researcher, a cosmos of synaptic activity and dendritic growth. But what if the brain is dysfunctional, what if Huntingdon's or Alzheimer's disease has created an extreme environment where memory, connectivity, and perception are altered, eroded, and ultimately destroyed? What then of the search for self, what then does the minds eye see? This paper seeks to address these issues through practice-based enactment of theoretical thinking. Based on my (2005/6) residency as 'Sciart Research Fellow' in the Neurology Department at Cardiff School of Biosciences, I will offer three time-based interdependent 'case studies' that explore the mind as a hostile and extreme environment.

Six Stages of Mutation is based on the Victorian science of Morphology (a precursor to contemporary genetics). A DVD morphology of my own mutating face as mapped via MRI scanning and subsequently edited as a series of dissolving, biological morphs, the face mutates from the surface characteristics through the layers of skin, muscle, tissue and bone, ceasing to function as a representation. This is no image caressed and transfigured by light, but one of invasion, bombardment, decay and disintegration, morphology mutating out of control, the self as alien and 'other'.

In *Vanitas: Seed-Head* three genetically linked morphing faces (parents and child) are set within an x-ray of a bulb like skull, floating against the 'coma blue' of the medical instruction screen. Aqueous humours representing the Aristotelian 'soul' circulate around the heads, which continuously 'loop', linking generation to generation in a technological vacuum of eternal life.

Bio-botanical Vanitas II shows the hippocampus of a diseased brain (infected by Alzheimer's disease) as it struggles to link and consolidate memories, evocative even as its power to consciously perceive a 'self' diminishes in this hostile and extreme environment. The works are the result of collaboration between lens-based arts, neurology, neuro-psychology, anatomy, and biological imaging: art and science exploring the complexities of the mutating and disordered mind.

Karen Ingham: Lens-based artist, writer and Arts & Science Research Facilitator, Dynevor Centre for Art, Design & Media, Swansea Institute, U.K. Doctor of Philosophy and writer on the anatomical theatre and biomedical epistemology. Arts & Humanities Research Council's 'Sciart Research Fellow' (2005-6) Cardiff School of Biosciences: publication *Seeds of Memory: art, neuroscience and botany*. *Anatomy Lessons* (2003-05 AHRC and Wellcome Trust) published and exhibited as a series of site-specific installations across Britain. 'Artist in Residence' Waag Theatrum Anatomicum, Amsterdam 2005 and The Old Operating Theatre Museum, London 2006. Essays include: *Vanitas* (Ffotogallery/IRIS 2005) and 'Descartes' Eye: theorising the art and science of observation' (*New Constellations*, Sydney MCA 2006).

http://www.sihe.ac.uk/clasi/anatomy.htm

Jorgensen, Jesper

Restricted Sensory Stimulation – A Challenge and a Risk for Humans in Extreme Environments?

The paucity of sensory inputs from the outside environment, in a confined and extreme environment, can be expected to pose challenges to crews on long duration missions on ex. the coming long term interplanetary manned missions, planned by Russia, USA, Europe, China, Japan. A history of research and practice has demonstrated that sensory deprivation or exposure to confusing sensory inputs affect individuals, both in their performance of tasks and their well-being. Therefore, design and architecture should take this into consideration when designing for future missions, and the possibility to use pervasive technologies should be discussed.

The space agencies must increase awareness of the psychological problems for these coming missions, far exceeding the present knowledge of psychological factors of spaceflight. It is evident that selection of crews are a part of the equation of success, but even the most well selected crew can develop severe mental problems owing to isolation and environmental factors.

The space environment affects the sensory system, both because it is an extreme environment and because of the confined and isolated environments that crew must live and work in while there. Sensory deprivation alone or in combination with other stressors must be avoided because they affect individuals in ways that can easily cause them to lose control of their situations. Very little is known about the long-term effect of restricted sensory stimulation in a space environment.

It is important that we correct this paucity because this is a situation that could occur in coming long term planetary expeditions. Some of the pathological effects can be foreseen due to the present research from¨analogue environments and simulations on Earth. Too little is known of the long-term effects of missing the normal stochastic stimulation from the environment. Will this affect the brain to lower the individual's cognitive ability and performance?

All this information gives rise to the question: How can the design of future space vessels and habitats prevent a decrease in sensory stimulation? Countermeasures are under consideration, but mostly target individuals and the mental state of a person, than the design of the environment and the group that will use it. Can space architecture compensate for the lack of sensory input, and in particular, the lack of normal stochastic sensory input? The design must try to create as many different sensory inputs as possible, without giving rise to over-stimulation. In houses here on Earth, we normally attempt to have a distribution of materials, colours, shapes and consistency of materials. We have soft areas in our living rooms to often very functional and hard surfaces in our kitchens. We attempt to have a distribution in intensity of light, temperature, and sound among and in the different rooms. We often have large windows that allow us to be in contact with the outer environment. It is, from a psychological point of view, worth considering if it will be possible to create the same distribution in the spacecraft. Also, would it be worth to investigate the means to generate stochastic information? For example, would it be useful to install large flexible screens in the spacecraft that could be used to depict stochastic information that is both abstract and concrete and played out in unpredictable ways? The use of Art should be taken into consideration as a part of this discussion on countermeasures to restricted sensory stimulation.

Jesper Jorgensen is a psychologist with additional degrees in: education, international development studies, linguistics and informatics. Before entering the space sector he has been trained as a psychotherapist and analyst, working in many years with treatment and counselling of people living in high stress environments or high stress life conditions. Now he is working as space psychologist, with special interest in use of information technology as support and countermeasure to psychological problems in crews in extreme environments.

Joyce, Michael
Poem as Written Word at Boundary Condition

The poem exists under extreme conditions in our time, taking its place in a medial and societal discourse where language has been enervated, if not exhausted, by neo-fascism, terrorism, fundamentalism, and global commerce. At the same time poetry itself, or formulaic language appropriating its name, has perhaps never been more ubiquitous, with virtual (networked) texts as well as affordable just in time, insty-printing and distribution, and monopolistic transnational publishing saturating every market segment.

Under such conditions it seems useful to consider the poem independent of the poet or the institutional and cultural construct of poetry. That is, to consider the poem as something of a stochastic process, fully non-deterministic and conjectural and, if not explicitly random, appearing so when encountered in the midst of overly-determined, exhausted, even hostile, discourses of the sorts mentioned above. The poem in isolation is always adaptive, mutative, generative, self-organizing. As such it shows itself to be well-posed in the mathematical sense, i.e., data-dependent and of a reasonable topology, despite what on first glance may seem its porosity.

A truly mathematical-based consideration of the poem as the written word at boundary condition is beyond the scope and expertise of this essay and its author. Instead the notion of boundary condition is here cast metaphorically, albeit cautiously to the extent that doing so is itself symptomatic of the already mentioned exhaustion and appropriation of language.

This essay means to speak toward the poem as it is situated beyond the formal construct of poetry and the person of the poet, that is, toward the poem as dynamic limit, the extreme expansion/contraction of language which signals a residue, a region of differential signification. The term "poem" is thus extended here to narrative; to successor forms of discursive prose ("creative non-fiction," postmodern theorizing, etc.); to meditation, prayer, spell, especially as they are reanimated in forms as disparate as blog or code; to self-consciously performative boundary works such as imagetexts, multimedia installations, kinetic poems, etc.; and finally even to ephemeral texts (SMS or chat, for instance) whose scope and cumulative effect moves beyond the utilitarian and informational.

The poem independent of the poet or poetry is deluded (and denuded) speech, hybrid, always in translation, transition, and– however paradoxically– transaction. "Worthless" and "meaningless," it stands as witness to, and token of, a self-sustaining, regenerative, and robust collective intelligence, complexity, and connectivity. The poem so seen becomes an evolutionary carapace, an armored, undigestable, and spiky seed pod like the water chestnut and, like it as well, an invasive, adventitiously rooted, persistent traveler, a literal form of life.

Here is a paradox. The poem, free of the poet or poetry, of course does not exist. Yet in another sense there is never a poem that is not a solitary knot of language and thus timeless, unauthored, and unmoored from the moment it moves from conception to execution to completion. Indeed the poem is never complete. For The Poet as for Poetry the poem's existence is contingent. Yet for the poem itself its being can never be contingent. It knows nothing of its origins or neighbors or the histories and traditions cobbled from them. The poem knows only itself and, by extension, both what it is not and from what it is formed.

The New York Times termed Michael Joyce's *afternoon* (1987) "the granddaddy of hypertext fictions" while the *Toronto Globe and Mail* said that it "is to the hypertext interactive novel what the Gutenberg bible is to publishing." Since then he has published numerous hypertext fictions on the web and on disk as well as novels, short stories, essays about technology and poems in print, including collections from SUNY and Michigan. A novella, *Was: annales nomadique /A novel of internet*, was just published by Fiction Collective2 in 2007. Lately he has collaborated in multimedia work with video artist Anita Pantin and composer Bruce Pennycook; and, in another project, with Los Angeles visual artist Alexandra Grant. He is currently Professor of English and Media Studies at Vassar College (USA).

Kisseleva, Olga
From World WideVip to TUTOR

TUTOR project is a work in progress developed since 2006 in Bilbao and in San Sebastian (Spain) within the framework of DISONANCIAS. DISONANCIAS is an interdisciplinary project founded in 2005 by Xabide Group to promote the relationship between artistic creativity and technological innovation and to establish a new dialogue between the business world (and its technological environment), the artist world (and its creative development) and society, the ultimate beneficiary of the results of innovation.

During my residency in the Integrated Safety Unit of LEIA Scientific Foundation, I was asked to carry out research on safe work environments to integrate disabled people with the aid of advanced design and simulation tools (CATIA/DELMIA, virtual reality) under the Design for All concept. Design for All implies that environments, products and services are treated in such a way that everybody, irrespective of age, gender, capabilities and cultural baggage, can participate with equal opportunities in our society. It approaches the concept of “safety” from an integrative point of view that uses one variable of business management combining Safety and Health at Work, Industrial Safety and Environmental Safety. The main goal of LEIA’s project is the development of intelligent tutors for disabled people and the integration of multimodal tools and emotional analysis to ease its use. The implementation of these tutors in ergonomic adapted mobile platforms, and the development of the clinical research plans to validate the interface are keys to assure the real usability of these kind of tools in the workplace.

Since 1999 when I created my first work with mobile phone, I see mobile devises like a kind of contemporary prosthesis which accompanies us everywhere. This dependence is the basis of her new project heading ironically World Wide VIP. To belong to this planetary elite, it is necessary to be in possession of three essential accessories - a mobile phone, a credit card, and a EU/Swiss passport (soon a simple chip). These three small electronic objects are able to connect us constantly to the world and to open all the doors to us. The problem, it is when we lose one of them: we become almost disable!

In LEIA’s project, thanks to the multimedia « tutors » which are constantly available via their mobile phone, the handicapped people approach normal people, but normal people become increasingly handicapped with the fur and as they lose their old reflexes being pressed more and more on these crutches electronic. In collaboration with LEIA Scientific Foundation, I took part in development of a new program intended to help the disable people to visit a museum of contemporary art. The first experience took place in Guggenheim Bilbao. The multimedia project was presented in the context of the photograph’s show, which put in scene the handicapped people using the tutors via their portable telephone in situations of the everyday life. A manner also of sensitizing the valid public, by a mirror effect, with its own statute of assisted.

Kliková, Alice
Limits of Biohermeneutics

This paper focuses on analysis of the biohermeneutical conception that describes living being by the metaphor of interpretation of literary work of art. The biohermeneutical approach to life attempts to overcome Cartesian concept of nature where living beings are considered as substantial objects grasped univocally by the human subject and classified in fixed categories. The biohermeneutical conception, on the contrary, considers a living being as an autonomous subject that interprets its environment, other living beings and itself. This capacity is presented as a generalized interpretation of a work of art (text) that has its fixed form (material inscription) and a variable but not arbitrary meaning.

The goal of my contribution is not to analyse the existing and perpetual conflict between biohermeneutical and traditional scientific scheme. Instead, I would like to concentrate on the analysis of the biohermeneutics from the “opposite point of view” and to show to which extent this conception is still based on the traditional issues. The classical character of biohermeneutics corresponds, among others, with the specific formulation of the metaphor of the interpretation of work of art (the object of interpretation has a hidden idea that directs all contextual actualisations). Other presuppositions that limit the biohermeneutical approach are the following: 1. Insistence on the essential self-reference and the dynamic self-production of the living being. 2. Insistence on essential proximity, identity or harmony between the living being and all its objects of interpretation (genetic code, another living being, the living being itself, its world in general).

I suppose that there is a potential alternative of biohermeneutics that can be inspired by the works of M. Blanchot, G. Deleuze or J. Derrida. These authors describe the experience with a work of art in a completely different way than biohermeneutics. On the basis of this experience they also describe the “encounter with another” (living being) differently from the biohermeneutical conception. Their approach is not based on the idea of a self-reference and self-identity of the experiencing being. The encounter with another living being does not develop in a primary proximity but in inhospitableness and it does not lead to a fusion of horizons (H.-G. Gadamer’s expression), but to the production of a fold of exteriority in the interiority of each participant. One constitutes a condition of possibility of the emergence of an exteriority in the living interiority. Another living being does not “live in the same way as I do” but it constitutes my interior limit, the exterior inside myself. The product of the encounter with another living being is not a mutual coherence, shared meaning and harmonic co-existence but a meaning that is inexperienced in the present moment, essentially “improbable” that “perhaps arises” in the complex non-linear topology of folding. The fold represents the structure of the living being; the living being is a fold of a living being in a living being. The life is not a compact and unified phenomenon. In order to manifest these ideas I will present a particular experience in art - the non-hermeneutical reading of a literary work.

Alice Klikova studied mathematics at the Charles University in Prague (PhD in 2001) and philosophy at the Université de Genève (DEA in 2004), the Charles University in Prague and the Université Paris X (PhD in 2005). She is currently associated professor at the Department of philosophy and history of sciences, Faculty of sciences, Charles University. She focuses on the post-phenomenological philosophy, especially on the question of excessive experience (corporal improvisation, imagination or non-hermeneutical “meeting with texts”). Publication of her book *Beyond the principle of identity* (in Czech) is planned for June 2007.

Kriesche, Richard
Defragmentation

the origin of religion, art as well as science is embedded in the notion of an unfinished and imperfect world, a world of gaps, fractions and fragments.

according to the ongoing scientific and technological progress we have suddenly become able to envision the imperfection on a global scale. the scientific progress that up to now has brought the deepest insights into the world by reducing the influence of religion and the arts, also enlightens that mankind's endeavour towards perfection and fulfillment is faling and going into the opposite direction. this wouldn't be a big issue anyhow, but the fierce religious climate worldwide demonstrates, that science can't substitute either religion, nor the arts. this affects the sciences deeply. instead of broadening the realm of science towards a holistic perfection, the scientific progress itself seems to be linked to narrowness and specialisation. the outcome is the deepest fragmentation and alienation of man and environment on the *reality level* ever. similar developments of narrowmindedness and artistic specialisation have driven the traditional arts and avantgarde arts for the sake of pure individualism into fragmentation and specialisation, thus loosing it's overall cultural grounding. more than that, art has lost its aesthetic significance and social meaning for the creation of visions of a coherent reality on the *symbolic level*.

imagination is an appeal for an information- and communication technology based "art-science-coherence". according to the knowledge built on information- and communication technology we rationalize the human being fragmented into millionfold bits and pieces, that fit together less and less. according to the same technologies man is also confronted with a millionfold fragmented universe. instead of further fragmentation on behalf of science on the one hand and arts on the other hand a coherent vision is needed. an "art-science-co" may be considered as the appropriate means to create the vision, in which the bits, pieces and fragments will fit together à la longue, and paradoxically to overcome fragmentation. this vision must be set on top of the same information- and communication technologies that are responsible for fragmentation.

within the given reality of science and technoloy "art-science-co" will counteract the scientific-technological fragmentation. today's information and communication technologies offer the view and preview of the desasterous effects of man-made fragmentation. (climate change, airpollution, animal extinction, etc.) this outermost, environmental tragedy has it's yet unseen grounding in the innermost moulding of todays human being, the fragmented man. this innermost fragmentation must be seen as one of mental pollution, moral extinction, mental desorientation, etc. leading to the outermost fragmentation tragedy. as a consequence there is no difference any more between internal mental fullfillment and the external global perfection.

the subject matter for "art-sience-co" is the human being with disabilities, the handycaped person. the handycaped person with mental and physical handycaps has become the frontman/woman of the technobased fragmentary figure, the bioelectric loaded man of our times. the handycaped figure has become todays avantgarde to question the overall fragmented process on an individual scale as well as on a global scale. the handycaped figure is todays metaphorical persona yet to become everybodys status by the evolution of the scientific-, techno- technological fragmentation.

1963 - academy of fine arts and university vienna.1970/71 - research grant to university college London. 1983/84 - DAAD fellowship berlin. 1984 - research grant to washington project for the arts. 1985/86 - researchgrant to M.I.T. 1988-91 - teaching profession at technical university Vienna. 1991/96 - professorship at ‚hochschule für gestaltung' offenbach,germany. 1995/96 - professorship at 'école nationale supérieure des beaux arts' paris. since 1997 - expert of the „council of europe's cultural policy and action division". since 1999 - „european commission" independent expert. since 2003 - landesmuseum joanneum; head of "kulturdata company". MIR RUSSIAN SPACESTATION 1991. DOCUMENTA 6, kassel. DOCUMENTA 8, kassel. 34. BIENNALE DI VENEZIA. 42. BIENNALE DI VENEZIA. 46. BIENNALE DI VENEZIA.

Krueger, Ted
Mediated Perception

This paper develops a model of human-environment interaction based on observations of humans in microgravity (noting physiological and perceptual adaptation), studies of visual and auditory impairment (noting perceptual and neurological plasticity) and understandings drawn from embodied cognition and skill-abased theories of perception. The model developed shows the human and the environment, not as separate entities, but in an intricate relationship of contingency, plasticity and mutual specification.

Within this context, it can be shown that the perceptual processes are not fixed by biology but are dependant upon the relation between afferent and efferent sensory fluxes. These relationships are subject to intervention and modification by technology as illustrated by sensory substitution devices that since the 1970s have been developed for rehabilitation medicine. This condition gives rise to the possibility of designing interfaces to open human perception to new phenomena – to enrich the perceptual world with additional dimensions.

As an example, this presentation will show the results of recent experiments undertaken by the author with devices designed to make the intensity, dynamics and spatial distribution of a select range of electrical fields available to direct human perception. Perception in this case must be distinguished from representation, visualization or other secondary processes that allow for understanding by intellectual processes rather than by an immediate apprehension integrated into and experienced as part of the world.

Extreme environments do not exist a priori but, as Louis Bec notes, depend upon the relationship between the specific conditions encountered and the organism in question. It may be argued that the hostility of extreme environments, such as those found in extraterrestrial, polar or undersea conditions, requires their interrogation by robotic and remote sensing rather than by human exploration and habitation. However, while these techniques are capable of providing representations they cannot produce experiences. Beyond functionality and instrumentality, arguments that will be continuously eroded by technological innovation in any case, I argue for the irreplaceablity of human presence in extreme environments from the standpoint of human experience. But paradoxically, humans can not experience extreme environments; rather they must observe them from within a protected bubble of technology largely vitiating that principal justification. Perceptual prostheses of the kind developed here can provide direct perception of hostile conditions from within the technological womb. Furthermore, humans are enabled by their biology to experience salient features of their terrestrial environment, but extraterrestrial and other extreme environments may require an immediate awareness of other spectra by means of technologically mediated prosthetic perceptions.

Ted Krueger is the Associate Dean of Architecture at the Rensselaer Polytechnic Institute where he directs the PhD Program in the Architectural Sciences. His research interests include Human-Environment interaction, cognition and perception. He is currently developing prosthetic devices that will allow humans a range of experience that is not presently available to them.

Kusahara, Machiko
Externalizing Our Body: Device Art and Its Experimental Nature

Human body has been continuously enhanced and extended with the use of latest technologies to meet an environment our "natural" body would not bear. Sometimes our perception fails to immediately follow a rapid change, leaving our body lost in the gap between the real and the perceived world. The gap may be eventually filled by further development of our perception on one hand, and by making the technology less visible on the other hand, to make it more "friendly". Today ubiquitous environment is promoted as a better solution for the mass. Technology will become invisible and our body will turn into interface, being a part of a system. At the same time services such as cell phones and Google Earth have repositioned our vision up in the sky. Extension of body is taking place at physical level as well. An exoskeleton robot suit named HAL recently helped a handicapped Japanese man to reach a peak in the Swiss Alps, automatically enhancing muscles as a sensor picks up slight changes in electric current. Our body is not only extended but also externalized in many ways. Science fiction is becoming the reality, while our real body and perception take time to catch up.

Could technology become safe or "natural" if it becomes invisible? Is it the right direction, that we are taken care of our life by invisible systems? Some artists turn the idea of automatic and comfortable environment upside down. Japanese media artists and researchers such as Kazuhiko Hachiya and Hiroo Iwata create environments in which our body meets extreme conditions. Hachiya's *Inter DisCommunication Machine* and Iwata's *Floating Eye* detach one's sensory input from body. With Hachiya's *AirBoard* and *Open Sky,* life of artist is literally at risk as he ignites the jet engine and test-flies the personal jet glider. Iwata's *Powered Shoes* enable a user to walk any direction without moving anywhere, as the wheeled shoes cancel each and every step the user has made. With Hachiya's *PsyCommu* system a participant experiences difficulty in walking straight, as his/her partner remotely controls the direction of steps simply by "thinking". Electric stimulus is used to alter body's natural perception system.

They are both active in creating Device Art. Device Art is a concept derived from analyzing Japanese media art scene. The aim is in proposing an alternative viewpoint in media art, with Japanese cultural background different from that in the West. Features commonly observed among Japanese media art works include appreciation of playfulness, positive attitude toward technology, higher degree of interaction, importance of right material, tool, and originally designed hardware-based interface, etc., reflect elements in Japanese art history. Above mentioned artworks that questions the relationship between our body and environment reflect features of Device Art even if playfulness and positive attitude toward technology may not sound coherent to works that may risk one's body. However, developing original physical interface inevitably leads to the questions on how our body has been enhanced or externalized. Experiments by Japanese device artists are worth analyzing, playfully. .

Machiko Kusahara is a scholar in media art and theory who has published and curated in interdisciplinary field connecting art, science, technology, culture, and history. Since early 1980s she has given lectures and published texts extensively on digital media art and culture. Her current research activities focus on intersection of media technology and Japanese culture such as Device Art (MediaArtHistories, MIT Press, 2007), panorama (Panorama Phenomenon, Mesdag Panorama, 2006), and utsushi-e (Japanese traditional magic lantern show). Kusahara served as a jury for Ars Electronica, SIGGRPH, ISEA, to name a few, and was involved in launching NTT/ICC and Tokyo Metropolitan Museum of Photography. Her texts are included in The Robot in the Garden (MIT Pres), Art&Science (Springer) among others.

Kuzmanovic, Maja / Gaffney, Nik
groWorld

The groWorld initiative[0] is developed along three trajectories - Sym, Bio and Sys. 'Sym' researches growth and transformation deployed in synaesthetic cultural experiences; including food production and consumption, biomimetic and biomorphic design along with games and artificial-life. 'Bio' works in biologically de-activated areas (such as urban centres, waste-dumps or abandoned industrial sites), addressing the decrease in biodiversity through techniques such as 'guerilla gardening'. 'Sys' is about technology that is inter-operable, energy-effective and sustainable, fostering greener, more humane engagement with the artifacts, processes and living systems around us.

In the speculative depths of the 'Sys' stream, perhaps the endeavor which raises the most questions, and eyebrows is HPI - human plant interaction, in particular the 'Human-Plant Interface'. As a botanical parallel to the oft misunderstood field of HCI - human computer interaction - HPI explores the nature of surfaces and processes required to facilitate mutually beneficial interaction between humans and plants.

HPI necessarily takes a symbiotic approach, and poses many questions, such as; how can this two-way interface be realised? what assumptions are we making with regards to how we understand humans and plants? do we need individual, specialised interfaces for each species, language or alkaloid, or are there more general approaches? how would they work? where, or what is the point of contact between the human and plants? how do we make the transition from machinic to organic? from boolean logic systems to systemic ecologic? what changes are required, and what further changes would occur in the plants, or humans using such interfaces? how does the nature of time, place and metabolic byproducts differ on each side of these interfaces? are they reconcilable, or even mutually explicable? what can we learn from each other? how can we form a closer symbiosis, and better understanding between the human and vegetable kingdoms once we open the gates between them? communication, or pollination?

This pollination requires methods, techniques and perspectives which suggest potentials beyond the mechanistic or teleological views of the universe; An "Organismal approach" in which "the vital co-ordination of structures and processes is not to an alien intelechy but is an integral part of the living system itself."[1] Something as tantalising as the unverifiable experiments of Cleve Backster and his "stately DRACAENA MASSENGEANA, one of the plants which had officially ushered in the age of sentient plant reactions."[2] Something to reveal possible futures where interactions between humans and plants moves from consumption, nutrition and competition, towards a fertile, symbiotic entanglement.

Suddenly I realize
That if I stepped out of my body I would break Into blossom. [3]

[0] http://fo.am/groworld
[1] Agnes Arber in "The Mind and the Eye: A Study of the Biologist's Standpoint."
[2] Ingo Swann's account of Backster's experiments in "Remote Viewing—The Real Story"
[3] from James Wright's poem "A Blessing"

Maja Kuzmanovic is a generalist interested in inciting small miracles in everyday life. Throughout the 1990s, she worked in MR, VR and online, infusing digital technologies with physical movement, narrative alchemy and audiovisual poetry. For her works, Maja was elected one of the Top 100 Young Innovators by MIT's Technology Review in 1999. She initiated FoAM in 2000 and has since functioned as FoAM's PI, eco+media artist and head chef. Her leadership skills have been recognised by the World Economic Forum, awarding Maja with the title 'Young Global Leader' in 2006. She holds a BA in Design Forecasting (HKU-1996) and MA in Interactive media (University of Portsmouth-1997).

Nik Gaffney is a founding member of FoAM, where he operates as a tangental generalist, designer, programmer and sous-chef. He prefers breadth-first-searches and bottom-up design; randomness as a strategy, and depth where required; dynamic to static; Lisp to C; realtime rather than recorded; and complexity over the complicated. He is also part of 'farmersmanual', a pan-european, net-based, multisensory disturbance conglomerate. {buzzing, clicking, destructuring and ecstactic flickering}. Partially Luminous.

FoAM (http://fo.am) is a distributed laboratory, designed to expand through the interstices between arts and sciences, traditional crafts and new technologies, physical and digital worlds. Following our motto "grow your own worlds, we research and create responsive environments, media and materials, encouraging participation, sustainability and a holistic approach to the world.

Lambert, Hervé-Pierre
Neuroesthetics, Neurological Disorders and Creativity

The contemporary neurology about arts renews some fields yet opened before, like study of painted representation of neurological disorders, or diagnosis of neurological disorders of artists. But it opens also new fields as, at first, the study of how a neurological disorder can alter productivity in recognized artists and other creative people, which is a largely unexplored field.

This new neurology on arts, one of the currents of neuroesthetics, consists of the analysis of neurological and neuro-pathological processes of decay in the cognitive and creative abilities, of the clinical analysis of disease-related changes in the work : for example, Alzheimer'disease in the case of Carolus Horn, supposed dementia in De Koonings'late paintings, impact of the subcortical infarction with right-sided paralysis in Caspar David Friedrich, unilateral left negligence after stroke in Fellini's drawings.

Furthermore, a collaboration between clinicians and artists suffering neurological disorders begun, like in the case of the painter William Utermohlen who agreed to participate to studies on the decay of his artistic abilities during his Alzheimer'disease until his death. This collaboration between clinician and artists suffering neurological declines is a field in full expansion with the clinical study of effects of neurological deficits on artistic production. The comparison between them and the effects on people without artistic habits contributes to the knowledge of these diseases and the neurology of perception. It clearly shows also the influence of artistic and creative habits in the decrease of symptoms.

By the side of this research on cognitive deficiencies and artistic creation, neurological disorders which used to be obstacles to creation, such as epilepsy, migraine, stroke, became subjects of artistic production by the people suffering of it. In the case of epilepsy, the artist Jennifer Hall represented the imagery of hallucinations and flourishing visions she perceived during her epileptic seizures, aims also of other artists like Juliane Ahrems and Kellyann Geurts. Hall organized in the Do While Studio in Boston an exhibition about epileptic arts, called From the Storm, and exhibited in Canadian, American and Australian neurological conventions.
Visions created by the migrainous visual aura which seem to have affected Hildegard of Bingen, Chirico and Picasso, became a subject of inspiration with artistic manifestations like in UK 'the migraine art" and the exhibition in San Francisco of this art, Mosaic vision.

This article aims at presenting the new relations between neurology and arts about effects of neurological diseases: stroke, epilepsy, brain trauma, Alzheimer, bipolar disorders, on creativity. The relations changed with the new collaboration of artists suffering them, and contribute to the new studies of how a neurological disorder can alter productivity in recognized artists and other creative people. But also, this new relation consists of the transformation of the traditional neurological obstacles into a subject of creativity and artistic productions.

Hervé-Pierre Lambert: Professor and researcher at the Antilles-Guyane University for comparative literature, contemporary arts and anthropology. Agrégation de Lettres modernes, Diplôme Institut d'Etudes Politiques de Paris, Lauréat de la Fondation Singer-Polignac, Thesis of «comparative literature». In Mexico: Ex-Director of the French Institut d'Amérique Latine. Ex- professor for history of the civilisations at Las Americas University and at the Centro Nacional de las Artes. Ex-Cultural attaché to the French Embassy in Switzerland. Member of: SLSA, Jasmin, ICLA/AILC, SFLGC, CEREAP. Catalogue: Masson, Musée des Beaux-Arts, Bern, 1996. Catalogue : El oxidado espiritu del siglo, Museo Cuevas, Mexico, 1998. «Art and the brain: towards the neuroesthetics?» in Recherches en esthétique, n°12, 2006.

Malina, Roger F.
Limits of Cognition: Artists in the Dark Universe

Recent discoveries in cosmology reveal that 97% of the energy and matter content of the universe is in a form that is of an unknown nature. 25% is in a form called “dark matter’ and is detectable only though its gravitational effects. 75% of the universe seems to be in a form called “dark energy’; its existence is derived from the fact that the expansion of the universe appears to be accelerating due to “pressure’ from the dark energy.

For all of human history, our species has been studying only the same kind of matter that it is made of, and that this matter and energy is a minor constituent of the world. The human senses are very badly designed to investigate the total content of the world. Even with all the extensions and augmentations to our senses, telescopes, microscopes and other devices, we have been oblivious until now to 97% of the content of the world around us.

From my background as an astrophysicist, I will summarise current understanding of the “dark universe” and describe my own involvement in a new satellite observatory, called the Super Nova Acceleration Probe. It will carry out mapping of the sky and will give distributions of dark matter and chart the evolution of dark energy. This observatory promises to have a scientific and cultural impact as profound as those of the Hubble telescope today.

I will contextualize the discussion with respect to the work of philosophers of science such as Thomas Kuhn, Ian Hacking, Michel Serres and Peter Sloterdijk. Science and technology have led to the development of a large range of different kinds of apparatuses to allow us to perceive parts of the world below the thresholds of our unaided senses, and to parts of the world that emit energy of a kind that our senses cannot even detect in principle.

I will discuss the role of artists in acculturation of both new explanatory systems that have been driven by these ‘extra sensory’ phenomena. I will argue that the role of artists will be essential in helping us develop the kinds of new metaphors, explanatory concepts and linguistic elements that will be needed as we explore the nano world, the worlds beyond the earth. As scientists continue to extend the limits of perception and cognition in these new extreme environments, artists have an important role in shaping the science of the future.

New generations of artists are sufficiently trained in science to begin to contribute actively to these new sciences in extreme environments. I will describe four artists in residence, co sponsored by the Leonardo organisation at the Space Sciences Laboratory of the University of California, Berkeley. The artists include Liliane Lijn, the group Semi-Conductor and Joanna Griffin, funded by the Arts Council of Britain, and the work of Rejane Spitz. These artists illustrates the very different kinds of art-science collaborations that are now taking place and contribute to the exploration of the limits and extremes of the world only now becoming accessible to our perception, cognition and understanding.

Roger F. Malina is a space scientist and astronomer, with a specialty in space instrumentation and optics. Previously he was Director of the NASA EUVE Observatory at the University of California, Berkeley, and more recently director of the Laboratoire d'Astrophysique de Marseille CNRS. He currently serves on the Comite National of the French CNRS for astronomy and on the French National Commission on Cosmology. His current research interests are in observational cosmology and the SNAP Consortium project for a space observatory dedicated to elucidating the nature of dark energy and dark matter. He is Chairman of the Board of Leonardo/International Society for the Arts/Sciences and Technology in San Francisco and President of the sister Association Leonardo in Paris. These organizations are dedicated to creating links between artists, scientists and engineers.

Mayeri, Rachel
Primate Cinema

Primate Cinema is a series of video experiments that translate primate social dramas for human audiences. The first experiment, Baboons as Friends, is a two channel video installation juxtaposing field footage of baboons with a reenactment by human actors, shot in film noir style. A tale of lust, jealousy, sex, and violence transpires simultaneously in human and nonhuman worlds. Beastly males, instinctively attracted to a femme fatale, fight to win her, but most are doomed to fail. The story of sexual selection is presented across species, the dark genre of film noir re-mapping the savannah to the urban jungle. The project arranges video ³mirrors² to illuminate the construction of primate selves and others. See http://www.soft-science.org/primate.html.

During the era of film noir, baboons were thought to be an apt model for human evolution. Moving from the protection of the trees to the open savannah, baboons, like human ancestors, would have to fight off predators, and hunt for food. Males would protect females, and aggressively fight amongst themselves for rank and reproduction. As human culture changed, the field of primatology changed as well. Baboons were found to be organized matrilineally, and other species became more popular as models for human nature.

Film noir, arising during World War II, projected a dark view of human nature, telling stories of alienation, survival, and desire. The private eye, the fall guy, the jealous husband were lured into mortal danger, trapped by situations not of their own making and doomed by irresistible drives. Femmes fatales--sirens of unbridled sexuality, the objects of the male protagonists¹ plots--would often lead men to their bleak fates. These urban tales of crime and murder were cast in expressionistic shadows and darkness.

Film noir`s `hard-boiled` visual style contrasts with the `raw` field footage of baboons. Film narrative applies a lens to nature, which cruelly lacks protagonist and plot. Through actors' eyes and bodies, viewers of Primate Cinema can begin to distinguish the unique personalities of individual baboons--their fears, desires, and social strategies. Clichés provide a shortcut for an understanding the soap opera of baboon life, yet they point back to the historical and cultural context of representation. The conventions of film noir enable a reading across species but at the same time foreground their lack of commensurability.

In the making of Primate Cinema, artist and media studies professor Rachel Mayeri collaborated with cognitive scientist Deborah Forster. Forster videotaped and analyzed the sexual dynamics of consort turnovers in Kenya for many years at anthropologist Shirley C. Strum`s Uaso Ngiro Baboon Project at Chololo Ranch in Kenya. The collaboration has generated conversations about scientific and cinematic representations of primates, and the issue of anthropomorphism.

In the last several decades, scientists have re-approached the commonality between the human and nonhuman primate mind with new lenses and tools. Primate minds are envisaged to be rational and emotional, embodied, and part of a larger social ecology. Genetic analysis shows that chimpanzees share 98.6% of their genes with homo sapiens. Conservation necessitates a political, culturally situated, empathetic, and interventionist approach to science. As opportunities to study the unruly lives of nonhuman primates in the ³wild² continue to vanish, our imagination of our closest relatives may be all that we have left.

Rachel Mayeri is a Los Angeles-based artist working at the intersection of science, art, and society. Her videos, installations, and writing projects explore scientific representation in topics ranging from the history of special effects to the human animal. Mayeri`s `animated documentaries` combine motion graphics and live-action, documentary and storytelling. Her chapter on artists` experiments with science documentary is forthcoming in Tactical Biopolitcs: Theory & Practice@ life.science.art, edited by Beatriz da Costa and Kavita Philip (MIT Press). Shown nationally and internationally, at Los Angeles Filmforum, ZKM in Karlsruhe, and P.S.1/MoMA in New York, she is Assistant Professor of Media Studies at Harvey Mudd College and a Guest Curator of the Museum of Jurassic Technology.

Novakovic, Gordana
Metropolis: an Extreme and Hostile Environment

Key words: ethics, dysfunction, emotion, information, manipulation, pathology, perception, sensorial, system

We do not need to go into space, or to the ocean depths, to study cognition in extreme and hostile environments. The digital revolution has changed the nature of our perceptual processes, and this in turn has changed our conscious experience of the physical world, inducing changes in cognition on a scale that is still unknown. The contemporary metropolis is now dominated by aggressive and emissive digital technologies, and has itself become an environment that is both hostile and extreme. How can we study the effects of this ongoing experiment on our cognition?

This talk will explore the way in which art can be used as a vehicle for a phenomenological investigation of these issues. There is no doubt that true novelty in contemporary art is found in the concept of interactivity: an active, responsive art work is a process rather than an object, and the audience, like a person in the city, is now a participant. In an interactive installation, the application of technology creates new forms of non-verbal communication. The whole body of the installation engages in a dialogue with the human body. The sensory system of the installation matches the participant's senses, and the computerised ‘nervous system’ of the installation matches h/er nervous system. The entire being of the participant is encircled with sounds, images, harmonies/disharmonies, noise/silence, and is electrified by the largely unknown emissive properties of the installation. In this way, the active audience becomes amalgamated with the installation, and the conventional boundaries of the human body (and brain) are called into question.

Fugue [http://www.fugueart.com] is a scientifically informed interactive art project based on the functioning of the human immune system. It symbolises the inseparable interconnectedness between all particles and functions of a living body, which is shaped by its inner processes as much as by its interaction with the world. Inspired by the musical form of fugue, the large scale piece operates within the framework of an artificial immune system algorithm, expressed through vision and sound. The complexity of the fugal structure modelled on deep biological functions can bring about congruence between the rhythm of the piece and the biological rhythms of the participant, opening a channel for a full awareness of the broad spectrum of stimuli and meditative forces emitted by the artwork, and their unfolding in the body of the participant. The talk, which will be supported by audiovisual material from Fugue, will ask how the artwork, which combines current scientific knowledge with contemporary electronic arts theory and practice, could be used to reveal the ways in which our senses, emotions, and perceptions have been seduced and warped by the world we have created, and how this process has ultimately affected cognition.

Gordana Novakovic. artist-in-residence at the Computer Science Department, University College London, belongs to the generation of artists who pioneered electronic art. Originally a painter, with 12 solo exhibitions to her credit, she has more than 20 years' experience of developing and exhibiting large-scale time-based media projects, most recent Fugue [http://www.fugueart.com]. A constant mark of her work with new technologies has been her distinctive method of creating an effective cross-disciplinary framework for the emergence of synergy through collaboration. She has presented and exhibited her work at major international festivals and venues, including ISEA, Ars Electronica, ICC, and Tate Modern.

http://www.gordananovakovic.com
http://www.cs.ucl.ac.uk/research/tesla/

O'Neill, Rob
The Morphology Project: Art-Science Explorations of Biological Shape Analysis and Evolution

The Morphology Project is a series of experiments designed to merge the study of comparative biology, from the perspective of morphology, with the methods and tools of digital animation. This work is dependent on collaboration with researchers at the American Museum of Natural History and other institutions. Projects range from analysis plug-ins for off-the-shelf and custom animation software to cinematic visualizations, all in an attempt to shed light on the processes of species (including human) evolution, scientific analysis, and natural history. The outputs range from techniques for scientific analysis, to art projects that educate and provide another level of meaning to the large datasets being processed. Projects have included, "The Theory of Transformations", a modern take on D'Arcy Wentworth Thompsons' grid-based species warping theories and "dataProjections", an artistic rumination of contemporary morphometric data and the gesture of scientific data collection. In "The Theory of Transformations", laser scans of a modern human and chimpanzee crania are three-dimensionally warped to resemble each other via procedural operations on a deformation grid informed by Thompson's 1917 work. In "dataProjections", 3D data collected by a biological anthropologist is traced, recreating the path of the scientists hand and creating a model structure reminiscent of the gorilla crania mapped. In both of these projects, the emphasis is on artistic visualization of scientific data.

The latest project, "dataFace", is part data analysis and mapping and part artistic experiment. The project utilizes the database of craniometric measurements collected by anthropologist W.W. Howells and transforms them into a three-dimensional point cloud. Howells made 82 measurements to record distances between landmarks and angles defined by anatomy from the crania of over 2500 individuals collected from around the world and housed at a variety of museums. This cloud is converted into a deformation surface and is used to recreate a semblance of the person whose skull was measured. Bringing life back to this data is a unique process and one that opens other artistic doors, namely applying evolutionary algorithms to the population to evolve this human sample thousands of generations. By applying parameters that attempt to recreate extreme environmental pressures, a virtual petri dish of human facial evolution is created. Notions such as mutation, adaptation, and emergence in a virtual evolutionary system are sought after. In addition, physical simulation is applied to the deformation hull to enact forces on the resulting populations over time. Historically, craniometric data such as this has been misappropriated and used for the purposes of racial classification. This project mixes the same data as a sample of the global human population and attempts to artistically evolve it. The results of this project include articles, software, rapid-prototype 3D prints for exhibition of the hypothesized faces of both those collected and the evolved dataset, and diagrammatic prints of the process and results.

All of these projects are carried out in animation systems such as Autodesk Maya and augmented by custom plug-ins that allow atypical data to be read, analyzed, and visualized using the power of Hollywood-style animation and computer graphics tools. There is tremendous potential for the application of animation technology as analysis and visualization tools for the biological sciences.

http://www.morphometric.com/morphology/

Rob O'Neill is an artist, programmer, and researcher working at the intersection of art and science. He is on the faculty of Digital Arts at Pratt Institute and is a Research Associate in the Digital Arts Research Laboratory there. He holds a BA in anthropology from Brooklyn College (CUNY) where he focused on anatomy and biological anthropology. Rob holds an MFA from Parsons School of Design in Design and Technology. Professional experience includes: researcher in Cultural Resources (Anthropology) at the American Museum of Natural History; Character Technical Director at PDI/Dreamworks; Technical Director at Charlex/Launch; and Studio Technical Director at Eyebeam. Rob's work was recently shown as part of ASCI Digital'06 "Bio/Med SciART" exhibition at the New York Hall of Science.

Osaka, Takuro
Artistic Proposals on the Cultural Application of JEM - 2009 ISS Art Experiment Program

“If I were to create art in space, it would be composed of light.”
Souichi Noguchi, Astronaut. (At an interview after a space mission.)

In 2008, when the Japanese Experiment Module (JEM) “KIBO” will be docked to the ISS (International Space Station), experiments for the Japanese Space Art Project will begin. Many astronauts have claimed that by experiencing “the view from outer space” and “micro-gravity”, they acquire a new sense of beauty and view of the world. Since 1996, JAXA (Japan Aerospace Exploration Agency) has been conducting experiments with art experts in order to achieve a fusion of the Two Cultures, the humanities and the sciences. Artistic experiments at the ISS will begin in 2009. Ten projects are now being designed and material tests conducted, and the following 2 are my proposals.

1) Zero Gravity Water Art

A marbling painting will be created by pouring sumi-ink on a water sphere floating in zero gravity. Marbling is a painting technique that has been carried out across the borders from ancient times. Sumi-ink, which has a different surface tension from water, will be poured on to a rotating water sphere, creating a beautiful pattern like a drifting cloud. The interest lies in seeing how the centrifugal force and surface tension will create a 3-dimensional pattern produced by the liquids that have different relative densities. It will be a water sphere painting with a canvas of water, the symbol of the earth and life, and sumi-ink, which is indigenous to the East. The created pattern will be blotted onto a dome-shaped Japanese washi-paper, fixed and brought back to earth.

This proposal was conceived by an experiment, supported by the JAXA Science Project Team and University of Tsukuba, to fixate a water sphere in space using high-frequency sound.

2) Zero Gravity Kinetic Art

The spiral pattern is a motion in space that is found everywhere in our universe from the DNA double helix to the Galaxy. The Spiral Top is a moving light sculpture in micro gravity based on the spiral patterns created by light and visual afterimages. It will also reveal unexpected reverse motions, as its center of gravity is at the edge of the structure. When the top with blinking LEDs on some of its arms is rotated and pushed forward, it is designed so that the trace of the double spiral pattern created by the light will appear in the air. Though this is the visual afterimage, the difference between the visual effect in zero gravity and that on earth will be interesting. This involves visual physiology and a method to collect the data for verification is being studied.

This proposal has been inspired by Chiaki Mukai, the astronaut, who had experienced a visual phenomenon (When she moved her gaze, the visual image trailed along with the eye movement.) right after she had returned from space, and by the reverse motion of a pair of pliers observed in zero gravity.

Looking back in history, there were always pioneers with visions that transcended the existing norms when initiating a new era. In that regard, the astronauts are pioneers who have experienced the view from outer space. Their experiences are conveyed to us through images and words, but by their collaborating with philosophers and artists, a discovery of an even newer view of the world can be expected. That is why the merger of science and art is an essential theme from which we cannot turn away.

Takuro Osaka was Born in Tokyo, Japan in 1948. M.A. from Tokyo National University of Fine Arts and Music Presently, Professor of Tsukuba University Takuro Osaka is a pioneer of light art in Japan. The “Cosmic Ray Series”, initiated in 1995, was a work in which cosmic rays were captured by a detecting device and transformed into a blue colored LED display. His related works include the “Lunar Project”, performed on July 16, 2000, when a long total eclipse of the moon took place. In this project, the moonlight was captured with 18 large mirrors over a rice field. In 2001, he was invited by JAXA (Japan Aerospace Exploration Agency–the former NASDA) as a fellow of the “Space Art Project”. He experienced Zero G Art on a parabolic flight. His art will be exhibited at the ISS between ’08 and ’10.

Pell, Sarah Jane
Hydromedusa: Aqueous Architectures for Use in WET Spaces

In the late 20th century, the architectural drivers for art, technology and human performance in outer space were about reliable, predictable, cost-effective short-duration mission-rated transhumanism /1/. As we propose longer space mission durations, human-related space architectures, and life support systems including water, air and waste requirements, must meet the more challenging needs of crew health, and the political, cultural and economic utilities of our time. Further research to understand the effects of the space environment on human performance and develop innovative dual-use architectures and physical and psychological countermeasures is critical.

By introducing 'Hydromedusa': a hybrid performance lab that proposes aquatic arts and biomimetic strategies in the development of innovative architecture, philosophy and choreography in weightless environment training (WET) spaces, this paper considers the potential body shocks associated with future long-duration habitation of outer space in combination with predicative imagination and creative design to respond to some of these challenges and illustrate how artistic approaches could contribute to innovative countermeasures with follow on research.

'Hydromedusa' employs aesthetic strategies for the design and fabrication of a prototype saline-filled hydromedusa (or sea jelly) inspired WET suit. It functions as a second skin for an artist/aquanaut in WET spaces to devise a new site-specific WET space movement repertoire. Aqueous architectures have proven usefulness in shielding humans from radiation in outer space. Prior studies have also shown water immersion as a potential countermeasure for maintaining orthostatic tolerance and exercise capacity during extended space missions /2/. Full-bodied immersion also provides a much-desired non-vibrational and omni-directional resistance on the body and, coupled with exercise, or hydrotherapy has the potential to counter muscle atrophy, bone demineralisation and cardiac arrhythmias whilst providing noted psychological benefit.

Building on STS-65 studies of hydromedusa and how they adapt to microgravity conditions, the artist-researcher will compare the vestibular function, propulsion and performance of the sea jelly with human behaviours underwater and in the WET suit. Data from embedded bend sensors/ fibre optics or variable resistance strips fitted to the joints of the WET suit itself and the body with digital real-time visual psychometric blogging strategies will track the human aquatic behavioural patters. Extenuated underwater 'play' will be encouraged without drill training time-tagged manoeuvres designed to ingrain utilitarian sensorimotor adaptation as is the case for astronaut suit tests. The range of motions of the hydro biotech fission body will be interpreted and relayed to audiences through performance and web mediums along with all of the biotelemetry and bio acoustic data. Imagine a new type of being and behaviour that might be born of the artistic communication, creation and technology between two axially, inversely-related spectrums: the depths of the oceans and the infinity of space; and the growth systems of the hydromedusa and the lifecycles of the humanoid. 'Hydromedusa' asks: Is our survival as a space-faring species is dependent on an in uterine-style aqueous biotech fission and subsequently facing the next frontier of sub humanism?

/1/ Transhumanism: a merging with technologies and shedding biological exclusivity as an evolutionary transition FM-2030 (1973). See http://www.transhumanist.biz/whatistranshumanism.htm Accessed 27 March 2007

/2/ Clement, G., Pevy-Le Traon A., Centrifugation as a countermeasure during actual and simulated microgravity: a review. Eur J. Appl. Physiol 92(3): 235-48 (2004) P. 1-13

Sarah Jane Pell is a performance artist and human factors researcher. Originally focused on making underwater performances, Pell's work now spans aqueous live art, digital media, installation, prototype pneumatic technologies, philosophies and experiments with advanced life support and living systems as new works of live art. Pell is an ADAS2 Commercial Diver. She holds a PhD Visual Arts at Edith Cowan University (2005), and attended the SSP at the International Space University, France (2006). Pell has recently returned from the NASA Ames Research Center, where she hopes to commence postdoctoral research in exploration (2007) and further research human performance and behaviors with innovative choreography and biotelemetry.

http://www.sarahjanepell.com
http://myprofile.cos.com/spellart

Philips, Mike
Normal to an Abnormal Degree

This paper discusses interventions made by the author and collaborators into the extreme territories that lie outside ‘normal’ human frames of reference. In the space-between the speed of a building, the collective archetypal view from space and the frame-by-frame memory of a catastrophe, lies a new perspective that relocates us from the foreground to the vanishing point. The view through the Albertian window has lost its relevance, it is no longer reassuring, it just doesn’t look ‘normal’ anymore.

The projects discussed that frame this ‘abnormal’ perspective include:

A) ‘Constellation Columbia’(1), a working prototype for an autonomous monument for ‘Dead Astronauts / Cosmonauts’. Constellation Columbia’ was commissioned for the zero gravity Parabolic flights from the Gagarin Cosmonaut Training Centre, Russia, by The Arts Catalyst MIR Campaign 2003. And its off spring Constellation Columbia 2 a ‘Zero G’ robot that’s primary aim is to seek ‘normality’ and orient itself in absence of gravity.

B) The Search for Terrestrial Intelligence (The S.T.I. Consortium (2)) turned the technologies that look to deep space for Alien Intelligence back onto Planet Earth in a quest for 'evidence' of Terrestrial Intelligence. The S.T.I. Project engaged in critical issues surrounding the shift from the hegemony of the eye to the reliance on autonomous systems to do our seeing for us. Do we recognise ourselves when seen through our artificial eyes.

C) And the slow zoom to the sloth-bot v1, a large autonomous robot, better suited to zero gravity environments but confined to a predefined architectural space. The sloth-bot v1 moves incredibly slowly, influenced by the flow of the buildings occupants and their interaction with the environment the sloth-bot will anticipate the temporal dynamics of the space, slowly and strategically positioning itself in the right place at the right time.

In his postfix to the “The Future in Space” circa 1958, Eisenhower frames the global clarion call to break free from the confines of the planet to “take Man where no human has ever gone before.” The pamphlet also identifies the nature of these brave explorers; the ‘Ideal Spaceman’ must be “Normal to an Abnormal Degree.” And further specifies a fundamental requirement that defines this ‘normality’ - they “must want to come back”! The future looked far simpler back then. The work discussed in this paper provides a number of different perspectives for time and space, they suggest that we may have already gone to far, that it is perfectly normal now, Humanity just doesn’t want to, or is simply unable to come back!

Notes:
1) Constellation Columbia, model/prototype, 2003. Zerogravity, A Cultural User’s Guide. The Arts Catalyst. 2005. Page 84-85 ISBN 0-9534546-4-9.

2) The S.T.I. Consortium was initially funded through a research and development grant provided by SciArt organisation (founded by the Wellcome Trust, The Arts Council of England, The British Council, NESTA, The Scottish Arts Council and Calouste Gulbenkian Foundation).

3) The sloth-bot v1 can be found at: http://www.arch-os.com

Mike Phillips is the director of i-DAT [The Institute of Digital Art and Technology] and heads the Nascent Art & Technology Research Group [www.nascent-research.net], a component of the A∑TEC [Arts Science Technology] Research Consortium. Private and public sector grant funded R&D orbits digital architectures and transmedia publishing, and is evident in two key research projects: Arch-OS [www.arch-os.com], an 'Operating System' for contemporary architecture ('software for buildings') which makes manifest the social and ecological life of a building and provide artists, engineers and scientists with a unique environment for transdisciplinary research; and the LiquidPress [www.liquidpress.net] which explores the evolution and mutation of publishing and broadcasting technologies and the kinds of collaborative spaces that emerge through human interaction with(in) them. These projects and other work can be found on the i-DAT web site at: www.i-dat.org.

http://www.arch-os.com
http://www: http://www.i-dat.org

Polli, Andrea
Sonic Interpretation and Experience of Extreme Events and Environments

Abstract: In this presentation the author will present art and science collaborations involving the interpretation of real-time, recorded and simulated data describing remote and extreme global weather and climate as image, animation and sound. As was seen in the recent Tsunami and hurricane disasters, many lives depend on the interpretation of global information. Developing a language or series of languages for communicating this mass of data must evolve, and part of that evolution must include the work of artists. The interpretation and presentation of data using sound is part of a growing movement in what is called data sonification.

Looking to the history of the world soundscape and acoustic ecology movement as a starting point, the author will discuss: acoustic experience as an essential part of the experience of an environment, sound as analogous to landscape: de-centered, immersive and multi-directional; issues of scale in the experience of environments (both temporal and spatial); the compression of long time frames and large distances to human scale experiences; the emotional and physical impact of sound; and the political dimension of this and related work as advocating for the preservation of the natural world.

Extreme environments sonified as stereo and multi-channel spatialized works include: real-time weather in the Arctic, the center of a highly detailed model of a hurricane, on the surface of the ocean, in heavily polluted environments and the results of data models predicting dramatic climate changes in the near future.

Detailed examples of two of the projects to be presented are *Heat and the Heartbeat of the City* and *N.*

Heat and the Heartbeat of the City is a series of sonifications that illustrate scientifically predicted climate changes focusing on the heart of New York City and one of the first urban locations for climate monitoring, Central Park. According to a 1999 report published by the Environmental Defense Fund, New York City will be dramatically impacted by global warming in the near future. The data sonified is actual data from summers in the 1990's and projected data for the summers of New York in the 2020's, 50's, and 80's using data modeled and formatted especially for the creation of these sonifications by scientists of the Climate Research Group at the NASA Goddard Institute. Listeners travel forward in time at an accelerated pace and experience an intensification of heat in sound. See http://www.turbulence.org/works/heat

Climate change in the Arctic is an important indicator of global climate changes. *N.* is a near-real time sonification of arctic data, updated regularly, from the National Oceanic and Atmospheric Administration's (NOAA) Arctic research program and from a weather model run by scientist collaborator Dr. Patrick Market of the University of Missouri. *N.* was created in collaboration with Joe Gilmore, a web artist and programmer from the UK. See http://www.andreapolli.com/n-point

Andrea Polli is a digital media artist living in New York City. She is currently an Associate Professor of Film and Media and Director of the MFA Program in Integrated Media Art at Hunter College. Polli's work addresses issues related to science and technology in contemporary society. She has presented work nationally and internationally and is currently working in collaboration with a number of scientists to develop systems for understanding storms and climate through sound. For this work, she has been recognized by the UNESCO Digital Arts Award 2003 and has presented work in the 2004 Ogaki Biennale in Gifu, Japan and at the World Summit on the Information Society in Geneva, Switzerland.

http://www.andreapolli.com

Punt, Michael
Between Thought and Matter: the Final Frontier

This paper proposes a commentary and overview of Mutamorphosis and, as a consequence, situates itself in its most inclusive category: Life. It highlights the most extreme and hostile environment in which we currently live and, it seems, as artists and 'visionary' scientists we have no alternative but to endure in the medium term. The paper asks how can ideas survive the relentless gravitational pull of materialist interpretation? Or put another way, how can any or all of the 73 key concepts that are embedded in the key words for this call be rescued from an inevitable interpretation as tropes in a mechanical philosophy?

The paper will outline its own extreme environment from a case study of the Orrery and attempt to position the arts and the sciences of the last four centuries in a discourse of 'the point of view' using historical case studies drawn from the science of Space. It will argue that the brief, but excessively influential, reliance on instrumental sensing has displaced the 'felt' experience as a conduit to insights of universal significance. It will revisit Romanticism in both the arts and the sciences and suggest its recovery as a viable theoretical framework for the overdue revision of the affective human as the most reliable avenue through which we can understand and negotiate with the visionary potential of technology.

In proposing an optimistic prognosis the paper will suggest that we regard the environment of muscular materialism which has dominated the arts and science for the better part of a century as no less extreme and hostile as deep space or Antarctica. As with our ventures in to these regions, the exploration of the space between thought and matter we will require special clothing, (no more Emperor's clothes) rigorous training, (for extreme stillness) and new technologies (of the self) to achieve the sublime concentration to undergo the necessary metamorphosis to escape from the gravitation pull of a materialistic monorealism.

Michael Punt is Professor Art and Technology and director of Transtechnology Research at the University of Plymouth and is also Editor-in-Chief of *Leonardo Reviews*. He has made 15 films and published over 80 articles on cinema and digital media in the last decade. He gained his PhD at the University of Amsterdam (*Early Cinema and the Technological Imaginary,* 2000) His key articles have been published: *The Velvet Light Trap*, *Leonardo*, *Design Issues* and *Convergence*. His most recent book: *Screening Consciousness: Cinema Mind World* Rodopi, 2006 edited with Robert Pepperell follows their earlier collaboration: *The Post-Digital Membrane: imagination technology and desire*, Intellect Books, 2006. http://www.trans-techresearch.net

Rogers, Kathleen
Bacteria, Geology and Blood

There is an intrinsic poison in life that creates cell death and the maintenance of life evolves from the maintenance of extreme, subtle and imperceptible movement.

Insights into biological phenomena made by molecular geneticists show biological changes in the structure of DNA over time and detail what happens to a molecular structure and gene expression in the period of one mitosis to the next. Chromosomes condense during mitosis and through the motion of intermingling and disentanglement become separate entities. There is a time based "betwixt and between" liminality in this biochemical condensation that remains unfathomable. In molecular genetics hybrid forms of "betwixt and between" are collected and stored. Potential states of being that are neither fully alive, biologically dead nor naturally self-regulating can be sustained experimentally is a state of permanent existence. Molecular geneticists working on the extreme limits of gene regulation and expression in gene therapy and retro viral research constantly evolve and apply models of this "betwixt and between" liminality. The chirality, handedness and silencing of genes and proteins can be reworked and re-mapped and provide science with an emergent and phenomenological model of life that correspondingly provides the subtle interactions, cell dynamics and vectors of death. . This crossing over of signals is the central fact of our own sentient existence and our empathy for other human beings and concern for other life forms is vitally associated with how we imagine and interpret this raw movement.

Ideas about the origins and evolution of life get constantly reversioned by the sciences. In 2005 I made a once in a lifetime journey to pay homage to the most ancient microbial ancestors of life on earth in a remote corner of Australia. Thrombolites and Stromatalites are living fossil communities of earliest bacteria occurring around the coast and within salt tidal lakes in Western Australia. The Thrombolites at Clifton Lake are rare archaeobacteria; these colonies of cells are the pre cursors of all living organisms on the earth. They sweat out layer upon layer of mineral limestone and these mats like some filthy swollen quilt appear in the shape of soft mounds. Billions of years old, these subtle generators of matter and photosynthesis opened a door to oxygenate the earth and in doing so left a geological trail of iron banding within the earth. This iron is a pre-cursor of haemoglobin in our own red blood cells. Photographs and descriptions give little indication of their scale, poetry and emotional impact. These mutualistic bacterial communities are the key example of how symbiotic evolution works.

Liquid salt water on Mars is in the form of highly concentrated brine may support a "salt-loving" type of bacteria called Halobacteria. This is a form of extremophile, archaeobacteria, adapted to surviving in saturated salt solutions. These speedy life forms would not only answer questions about the origins of life and death on earth but also show how the ancient swimming cells and molecular forms from earth and mars could be retrieved, exchanged and cultivated.

Kathleen Rogers is an artist, researcher graduating in the 80's from the MA Experimental Media programme at Slade School of Art with a background in conceptual computation; she has been engaged in interdisciplinary art since the 90's. Since 2000 her artistic practise has engaged with cell and molecular biology and the cultural themes of genomics. Her work combines intuitive review, associative and non-explicit, trying things out and theoretical review. Artistic creation and reception is formed around sensory experience and her artwork explores how aspects of human biology can become more directly accessible in emotional and aesthetic terms. She is a Senior Lecturer for Digital Screens Arts programmes at the University College of Creative Arts, UCCA, Farnham, UK

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Roosth, Sophia
Zeroing Out Biological Time: Standardization and Surprise in Synthetic Biology

Synthetic biologists, inspired by computational architecture, aim to design standardized biological parts ("BioBricks") that can be assembled into complex biotic devices and systems. In so doing, they hope to usher in an age of biological Taylorism. How do synthetic biologists — a mix of biologists and engineers — imagine and configure biological temporality when they design synthetic organisms? In this paper, I seek to answer this question by focusing on MIT synthetic biologists' attempt to refactor bacteriophage T7. The T7.1 project demonstrates how biologists' and engineers' different conceptions and expectations of "life" get built into synthetic organisms. While engineers approach synthetic biology as a means of "biological disenchantment," biologists anticipate that biological things are lively — that they will escape the expectations of predictive computer models and experimental protocols. Using a term gleaned from one of the principal scientists who synthesized T7.1, I call biologists' learned capacity for surprise "respect for the organism," and refer to the engineering technique that attempts to disenchant the organism (but that concurrently opens up a space in which organisms may demonstrate their lively contingencies) as "zeroing out" biological temporality. The temporality synthetic biologists engineer into novel organisms is one that is modeled on computational architecture: biological models mimic the linear time built into digital models of biotic systems. Synthetic biologists' chronoception — perception of time — collapses representation and life; T7.1 certainly animates the sum of experimental knowledge of T7, but it is also a viable embodiment of that biological knowledge and an intervention into life that upsets and recursively elaborates the logical connection of theories to things.

Sophia Roosth is a doctoral candidate in the Program in History, Anthropology, and Science, Technology, and Society at MIT. Her research focuses on the anthropology of the experimental life sciences, specifically the emerging field of synthetic biology. In studying the construction of biotic systems *de novo*, Sophia is most interested in examining how biological materials are designed, fabricated, and standardized; how engineering idioms are imported into biological practice; and how engineers are intervening into biological temporality. More broadly, she is concerned with the ontology of biological substance, the intersection of biology and design, and the discursive traffic between organisms and machines. She also writes about the use of acoustic technologies to listen to cells.

Rossi, Michael Paul
Kitsch and the Meaning(s) of Life

In May of 2003, the Milstein Hall of Ocean life in New York City's American Museum of natural history re-opened to the public after undergoing a sixteen-month overhaul. The hall's renovators defined the cavernous space less as a grand, Beaux-Arts gallery for showing off the museum's collection of sea life, and more as a "virtual ocean": a full immersion environment intended to offer up the wonders of the sea as though viewers were themselves floating in the deep. In the new hall, a procession of technologies transport visitors through the manifold scales and limits of oceanic life: computer controlled bioluminescent fishes and microbes winkle along the walls, acrylic glaciers demonstrate life in frigid arctic waters; an eerie, undulating ultramarine glow insinuates submarine depths; a bodacious, fiberglass blue whale stands for the vastness of the sea itself.

But before it represents the cutting edge of marine biology, the virtual ocean should perhaps first and foremost be seen as a monument to kitsch – the mass cultural rehashing of nebulous sentimentality, the manufactured trace of fellowship in repetition. A plastic xanadu of biological ur-reality, the virtual ocean presents seekers of truth in tennis shoes with the crushing depths of the sea and with the minute metabolisms of protozoa, even as they are encouraged to feel themselves at one with a globally connected network of life. This virtual ocean isn't simply a rehearsal of old standbys; it's kitsch of the avant-garde, kitsch at the limits of life. The "vicarious experience and faked sensations," of Clement Greenberg's kitsch become, in the virtual ocean, an introduction to an immersive consciousness not simply of the sea, but of emerging biosocial orders – shared experiences of biological and cultural subjectivity.

This paper will use the isomorphism of the virtual ocean as a stepping-off point– a diving board, or perhaps a plank– from which to explore the relationship between kitsch, biosociality and other tenacious forms of modern(ist) life. If, as Michel Foucault remarked, life itself is drafted into developing orders of production, then life itself emerges as kitsch, and kitsch as a definition of life. Drawing from the work of Foucault, Theodoro Adorno, Clement Greenberg, Lily Kay and others, this paper will examine popular pedagogy, gallery painting, instructional comic books and bio-engineering processes in an attempt to illuminate intersections between emerging aesthetics of the study of life, and the production of new artifacts, cultural tropes, and shared vocabularies.

Michael Rossi is a graduate student in MIT's program in the History and Anthropology of Science, Technology and Society. His research focuses on modernity and aesthetics, especially in the technological and medical practices of the early twentieth-century United States.

Ryan, Susan Elizabeth
Dress for Stress: Wearable Technology and the Social Body

In the 1990s, Lucy Orta created survival attire as wearable artworks concerned with social connectivity under adverse circumstances. As fashion was driven by desire and self-identity throughout its development in the modern era, in the future what may pass for clothes, or extend beyond them, may be driven by fear not only of death, but of extinction. Orta's work has contributed to a new critical practice that considers the ramifications of "refuge wear."

This paper considers the work of artists and designers who conjecture about the future of body covering as both survival mechanism and social tool. They design technological, biological, or performable wearables in order to conceptualize those threats to species survival and collective experience that are currently perceived, and others that are being predicted. Clothes that protect us from extreme environmental conditions have a long history in the discourse of dress (heated coats, for example, were shown by major designers in the 1930s). Interest in insulated and thermally regulating attire has broadened to include explorations of architectural clothing that forms nomadic lodging. Current trends project visions of mobile populations that can move out and hunker down, and fears of unpredictable environmental challenges that keep populations on the run.

Further, new practitioners of critical art and design of wearables focus not just on environmental, but also on social fears, and the need for body security. Biological threats like pandemics, for example, informed Samira Boon's "Get Well Soon" masks that offer protection but also counteract the isolating effects of disease, promoting identity and connectivity. Other threats from within society itself, like terrorism, factional struggles, and military and law enforcement activities, have inspired models for protective garments that also function as social discourse. This is exemplified by a series of projects done at the Bezalel Academy of Art and Design in Jerusalem in 2003--for example, Galya Rosenfeld's chainmail headscarf. Other work poses critiques of existing discourses of dress. "Ethical fashion" has emerged as a field of debate, and biological experiments with fabric grown from animal tissue (Tissue Culture + Art Project) takes issue with existing fashionable fabrications.

Under ultimate conditions, will we be dressing our own bodies, or imagined ones? If we encase ourselves in protective cocoons that sacrifice phenomenological, body-based communication, will our "wearables" migrate to virtual "be-ables," self-styled avatars in communities like *Second Life*? Will communal experience of dress, identity, and culture take place only on line, or disappear altogether along with its corporeal basis?

Much work in this field is hopeful, suggesting that security and self-expression will remain linked terms for some time to come. This paper will sort through the new critical practices in wearable art and design and consider the possibilities: if dress under stress will preserve the poetic dynamics of social communication via personal attire in the face of calamity, or if body-based concepts of social continuity will go the way of the dinosaur.

As Associate Professor of Art History at Louisiana State University, my courses in New Media Art History and Theory are part of a New Media curriculum I am helping to plan for the School of Art. I am researching a publication on artists' wearable technology and I delivered a talk on this subject for ISEA 2004. With Patrick Lichty, I am currently preparing the exhibition *Social Fabrics: Wearables + Media + Interconnectivity*, sponsored by the Leonardo Educational Forum, for the College Art Association, Dallas 2008. In Louisiana I directed the Baton Rouge Video Project and serve as art consultant for the LSU Center for Computational Studies. I have contributed to the online journal *Intelligent Agent*. .

http://www.artistory.us/

Santaella, Lucia / Garcia, Wagner
Cognitus: New Cognitive Tools to Assess Environmental Risks in Amazonas

Petrobrás, the Brazilian National Oil Company, built a pipeline in Western Amazonia to transport crude oil from the Urucu river production region to a terminal in the vicinities of Coari, a city located on the right margin of the Solimões river. Tankers then ship the oil to another terminal in Manaus, capital of the Amazonas State. Between dry and wet seasons, water level dramatic changes in the Solimões River reach up to 14 meters. This strong seasonal character of the Amazonian climate gives rise to four distinct scenarios in the annual hydrologic cycle: low water, high water, receding water and rising water. These scenarios constitute the framework for the definition of oil spill response planning in the region, since flooded forest and flooded vegetation are the most sensitive fluvial environments to oil spills. The methodology currently used in Amazonia to assess environmental risk to oil spills includes image processing of remote sensing data and geographic information systems. These procedures are carried out in order to generate sensitivity index maps for fluvial regions of the Solimões river. It is undeniable that this methodology has provided a great deal of information about oil spill environmental sensitivity in Western Amazonia. However, the view it provides is limited and ambiguous, if we attempt to fully understand the extraordinary fluvial environment in Amazonia. The river seasonal variation is represented by an intricate arrangement of channels that change with time. The hydrological cycle produces and wipes out huge patches of flooded forest. Such a landscape regulates the spatial distribution of flora and wildlife, as well as the social habits of riverside villages. This web of relations is progressive and evolutionary and conventional approaches are not robust enough to address the complexity of spatial and temporal patterns in the Solimões River alluvial plain. A wider and more complex scientific approach is needed. The Cognitus project was born to attend such necessity. It is a theoretical and empirical study of the Amazon complex system. From molecular to ecological and evolutionary scales, the project is conducted as an interdisciplinary inquiry. There is a deep interaction between Mathematics, Art, Philosophy, Semiotics, Computational Science, Evolutionary Robotics, Remote Sensing, Chemistry, Hydrology, Geology, Ecology, Botany, Genetics, Sociology, and Economics. The aim of this paper is to present the state of the art and the future perspectives of this project.

Lucia Santaella (www.pucsp.br/~lbraga) is full professor at São Paulo Catholic University (Pucsp), PhD in Literary Theory (1973-PUCSP) and Livre-docente in Communication Sciences (1993-São Paulo University). She is head of the post-graduate program in Technologies of Intelligence and Digital Design (www.pucsp.br/tidd/), director of CIMID, Research Center in Digital Media, Pucsp, and also director of the Center for Peirce Studies. She is one of the

honorary Presidents of the Latin-American Federation of Semiotics and correspondent member of the Argentinian Academy of Fine Arts. She has been elected President of the Charles S. Peirce Society, USA, for 2007. She has published 28 books and organized 7 books. Besides these books she has published more than 200 articles in journals and books in Brazil and abroad.

Wagner Garcia is an architect and technological artist who got his PhD at São Paulo Catholic University in 2004. He is a pioneer in Brazil in land art, sky art, and telecommunication art projects. He is presently working in the intersections of science, art, and technology, and he is one of the Directors of Cognitus, an innovative research project which is turned to the preservation of the environment in the Amazon and which is financed by the Research Center of Petrobrás, the Brazilian oil company.

Sau Bin, Yap
Mapping Art Spaces: An Artist's Quest to Chart History

Maps have often had what Walter Benjamin called an 'aura' around it. At the turn of the 21st century, the study of maps has undergone swift and drastic change. You could say in some ways that maps are losing its 'aura'. With easy accessibility of virtual globe program such as Google Earth, the typical function of maps is redefine in many ways by anyone anywhere for whatsoever reasons. This paper shares of one such experience.

Yap Sau Bin, a conceptual artist, embraces the technology of virtual globe mapping in documenting his journey of tracking location and happenings of the local art scene. His on-going art project entitled *Mapping*KL*ArtSpace* started with the mapping of alternative art spaces in Kuala Lumpur (KL), the capital state of Malaysia. The artist was fascinated while playing with the features of Google Earth Beta in late 2005, thus the idea of identifying and mapping the art spaces in KL came about. Then gradually it extended to mapping sites of galleries and museums he visited, to historical sites of outdoor installation and performances. At present, this mapping continues whenever he visits a new art space and documenting new installation art works and performances. In tandem with his personal tracking, the artist is also mapping other artists' experience and information of interesting art spaces and galleries as well as site specific artworks. Coming from a rather conservative art scene, this art project is also an attempt to offer an alternative way of recording and documenting the development of arts in this country through the eyes of the local artists and the general public instead of the usual selected few art historians or curators.

From *Mapping*KL*ArtSpace*, a spin off came about. Hence, a performance based project called *ARTraceKL* was born. Here, Yap turned his body into an active agent of being physically engaged in the artwork. *ARTraceKL* is a paid-art-service taking visitors to see art spaces, galleries in KL. As an artist, it is his contribution of engaging and sharing of his mapping resources with art audiences and the public in general to create an awareness of the contemporary arts scene in Malaysia. This is a conscious effort on his part to depart from his usual body of artwork where he is physically withdrawn, leaving only traces of his creation. One thing is certain: *Mapping*KL*ArtSpace* will continue to expand infinitely. Eventually the question of authorship will arise. Who owns these historical markings on the virtual map? Whose history are we writing? These questions have yet to have an answer. But then again, do we need one?

* *Mapping*KL*ArtSpace* was showcased at "*Kata di Kota* – A Malaysian Exhibition of Contemporary Art in Cuba", in conjunction with the 8th Havana Biennale, National Art Gallery, K.L. (2006).

Yap Sau Bin obtained his Bachelor of Arts in Fine Art from the Birmingham Institute of Art and Design, England in 1998. He is currently a staff at the Faculty of Creative Multimedia, Multimedia University. Yap is also a founding member of Rumah Air Panas [RAP], an artist initiative based in Kuala Lumpur. He had received awards in the Young Contemporaries Arts Award by the National Art Gallery in 2000 and 2002.

Schlacht, Irene
Art, Design and Human Metamorphosis in Extreme Environments

The author will present her projects on Natural Design, related to the study of color, light and symbol, to enhance the living conditions of astronauts and people living in extreme habitats. This abstract approaches contemporary consideration of Art and Design in extreme contexts: *"The beauty of life should be guaranteed in particular for inhabitants of extreme environments that dedicate their life for the love of planet and science. To enhance the living condition of such people that live under strong psychophysical stress factors, (as astronauts and other category that work under radioactivity effects), we need Art and Design".*

"We need to feed also the spirits to enhance human productivity!"

In the framework of Extreme Environments (Spacecraft, Underground or Antarctic Laboratory, Submarines) Art, Design and well-being enhancement, seem to be an unnecessary difficulty, affecting the extreme technological conditions and high motivation of the crew.

Before we will be genetically modified as superhuman or machine, the extreme and hostile world presumes an artificial protection to guarantee the human life, but also elements to enhance the physical and mental adaptableness.

High motivated scientists, millionaire tourists, military caves, may benefit from accurate environmental design of spacecrafts, to guarantee comfortable conditions and to carry out tasks with the best proficiency and results.

"Artificial Metamorphosis or Natural adaptation"

As the human's nature is to be adaptive and survive everywhere, human bodies themselves undergo metamorphoses (society relationships, body adaptation...) when living in altered environmental conditions (1).
"In space individual physiological changes are possible such as the body "neutral posture" consider in 0 gravity ergonomics, but we cannot take as an example of anthropological adaptation to space the decalcification of bones and the reduction of muscles, because the consequence will be simply illness, malformation and body decay, not adaptation! (Masali, 2007)". However as considers from Natural Design (2), the best conditions for human is "the climate" earth, living with out variability of natural stimuli affect on our productivity and state.

"Art and Design can create the small imperfections: "human elements" that improve the usability of perfect artificial and aseptic environments" (Wysocki, 2007).

Of course, from this point of view Art and Design require an extensive appraisal even when someone, in the Space business, states that: "whatever the life conditions will look like, we will always find volunteers that want to go in the Space", Nevertheless today these arguments have to be, providentially, re-evaluated: *"motivations may be different from pure bravery and this is a strong argument for real Design: that can be the Spirit in the Engineering! (Masali, 2007)*

(1) Sometimes bio-cultural changes are possible also in short micro evolutionary times such as altitude (Sherpa, "Andine peoples") or cold (Inuit) adaptation.

(2) "In context as Space habitants humans are confronted with an 100% artificial environment. Natural Design; by relaying on shapes, colors and proportions (ex. "Golden Ratio") from nature, can create an environment which would help the habitants to work, live, communicate in an subjective, ergonomic and natural way".

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- Prof. Melchiorre Masali, Università di Torino, Italy
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Irene Schlacht, is a product and graphic Designer who wrote a thesis about "Color Requirement in Outer Space habitats" (Followed by Prof. Dina Riccò) at Politecnico di Milano, she also spent 2 years as "Outer Space Human Factor Researcher" at Università di Torino (Followed by Prof. Melchiorre Masali), and after a stage at Alcatel Alenia Spazio on Space Design, she directed an experiment on "Color perception in microgravity" taking a parabolic flights with the ESA 2006, Today she is Freelance Graphic Designer and PhD student at Tu-Berlin in the Human-Machine System Faculty. The PhD theme is "Color and Icons as Information design system for extreme habitats" (Followed by Prof. Matthias Rötthing).

http://www.struktur-design-berlin.com/sirene

Seaman, Bill
Neo-sentience: Positive Techno-evolution or Extreme, Hostile Takeover Environment?

There is a long history and mythology surrounding the creation of intelligent entities reaching back to Pygmalion and Prometheus. The invention of intelligent machines has also at times been shown in a "hostile" light in literature, across the arts, and within scientific discourse. Thus, an un-accepting world potentially becomes a "hostile" or "extreme environment" for the arising of new forms of synthetic cognition. Seaman will unpack a series of historical instances exploring the nature of intelligent entities, and will discuss some of the dystopian mythologies surrounding the creation of intelligent machines. This set of relevant historical instances, drawn from a diversity of perspectives ranging from mythology to popular science fiction, will include Golem, the Homunculus, and notions surrounding the ghost in the machine, as well as more recent works delivered from a "hostile" perspective including Frankenstein, Hal, and War of the Worlds. Along with such popular stories the creation of intelligent destructive robots by the military will also be discussed from a dystopian perspective.

In an ethical and somewhat more utopian light, Seaman and Rössler have been articulating two models for an intelligent situated robot: 1) The generation of such a system via the integration of a series of conceptual approaches utilizing a parallel processing computational system, multi-modal sensing apparatus and an embodied robotic housing - The Benevolence Engine; and 2) An alternate, long term approach to a new form of computation through the generation of an Electrochemical Computer, a multi-modal sensing system, and networked robotic environment - The Thoughtbody Environment. Alternately, Seaman has made a series of artworks exploring a poetics informed by this research. In articulating these models we have begun to define a new branch of science related to artificial intelligence. We call this new research field Neosentience. We have articulated an operational definition for Neosentience which will be presented.

It must be noted that any sentient entity that might be generated, initially based on the abstraction of human cognition and sensing, would have a set of different qualities to that of the human. In particular these differences relate to qualities of embodiment, bundled sensing systems, communication potentials, networking capabilities, and synthetic emotional drives. Teilhard de Chardin in his fascinating book, The Phenomenon of Man discusses the "Omega Point," an evolutionary movement toward a unified consciousness. Other philosopher/researchers like Roy Ascott and Pierre Levy have also written about the potentials of particular forms of technological connectivity in terms of a related unified sphere of consciousness. Could the networking potential of new technologies and in particular Neo-sentient machines, enable an evolutionary shift to a new form of neosentient cognition arising in a unified manner? Would such a Neosentient robot become a "Benevolence Engine," promoting new forms of mutually supportive human/machine interaction or would a fearful world divert the potentials of such a device away from forming a reciprocally beneficial symbiotic relationship between human beings and intelligent machines, and generate a dysfunctional environment akin to an "extreme hostile takeover environment"?

Bill Seaman received a PH.D. from the Centre for Advanced Inquiry In Interactive Arts, University of Wales, 1999. He holds a MSvisS degree from MIT, 1985. His work explores an expanded media-oriented poetics through various technological means. Seaman's works have been in many international shows where he has been awarded two prizes from Ars Electronica in Interactive Art (1992 &1995, Linz, Austria); International Video Art Prize, ZKM, Karlsruhe; Bonn Videonale prize; First Prize, Berlin Film / Video Festival for Multimedia in 1995; and the Awards in the Visual Arts Prize. Seaman was given the Leonardo Award for Excellence in 2002 for his text OULIPO / VS / Recombinant Poetics." He is currently working on a series of texts in collaboration with the scientist Otto Rössler.

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Smith, Brad
Ascribing Status to Life Forms

The social, political, and moral status of life forms is contested by the individuals and groups who have vested interests in the life form. The status ascribed to lives is susceptible to the choices of language and visual depictions used to name and represent the life form.

What status should be given to mutated, altered, transgenic, hybridized, or extreme biological forms? What status is implied when they are considered property, tissue, life, cure, pandemic, organism, member of society, or alien?

I will address processes by which society ascribes status to living entities by using examples from my own research in magnetic resonance imaging of embryos. I will also present my own depictions of ambiguous life using photo-micrographs, MRI's, ultrasounds, and images of pseudo-transgenic manipulated human embryos. I will discuss how these depictions were permitted and facilitated by complex social structures and how these endorsed depictions then constrained and altered continued access to the same embryos.

Of particular interest to me is the manner in which visually depicting an embryo politicizes it and makes it "known." Its meaning (and status) can be variously conferred and implied by direct sight, drawings, ultrasounds, paintings, photographs, sculptures, virtual models, in-utero video, or MRI's. Each depiction results in a unique interpretation.

Nomenclature also politicizes the life forms we describe. Consider the inferences associated with the following names: embryo, un-born baby, zygote, child, conceptus, Emily, specimen, son, organism, patient, tissue, person, life form. The language used to describe extreme life forms will project attitudes and assumptions onto those forms just as these names have done to the life entities involved in stem cell research and cloning.

The following questions have fallen out of attempted and actual research on human embryos:

- What should be done with excess frozen embryos?
- Should embryos be used to seek relief from disease and suffering?
- Should embryos be created for research?
- At what embryonic stage is research justified?
- What role should various institutions play in deciding these matters?

The questions above suggest what might become relevant to the creation and use of ambiguous and extreme forms of life:

- What status should be given to any form of life?
- Is the status inherent or granted?
- What biological attributes should be used to ascribe status?
- What non-biological attributes might be used?
- How does status change as life develops, alters, matures, mutates, or hybridizes?
- What events can or should serve as landmarks for attributing changing status?

Ascribing status to life forms can be divisive because the interests of various stakeholders often conflict or compete. Some stakeholders have direct, biological concerns and others have indirect, political, economic, or social concerns. Who are the stakeholders in deciding what behaviors are appropriate toward new life forms? Who will be affected, who is concerned, and who has an interest? What influence should various stakeholders have in deciding policy and behavior.

I will present animations, drawings, visualizations, photographs, medical imaging, paintings, and sculptures to demonstrate the connection between depictions of living entities and the ascription of social status to those life forms.

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Brad Smith is Associate Dean for Creative Work, Research, and Graduate Education at the School of Art and Design, University of Michigan. He is also a Research Associate Professor in Radiology at the University of Michigan. Smith's current work addresses the intersections of science and art with a focus on reproductive technology and its impact on society's understanding of the social, ethical, and political status of the embryo. Smith investigates visualization methods for cardiovascular development and has established globally adapted protocols for Magnetic Resonance Microscopy study of embryos. He creates animations and graphics demonstrating developmental biology for museums and documentary film companies.

Stein, Suzanne
Foresighting for Meaningful Innovation

In this paper I propose to look at the present role of Foresighting in innovation including an overview of techniques that have been mainstays and new forms that are emergent. For the last few decades foresighting has been used in corporate and governmental contexts to understand and respond to the changing contexts and that they could find themselves in. This was a predominantly reactive stance. However, the core of the paper discusses an increasingly active and formative role: how foresighting is being used as a tool to help artists, scientists and business innovators create a desirable future. In particular, trend monitoring and role-playing hold out the possibility of situating innovation in a meaningful seat - for socially-aware design innovation. While this paper will look at what organizations are employing which techniques – from Philips Design, to the Architectural firm, ARUP, to the CFC media lab – it will discuss the projects at SMARTLab and how these draw upon emerging trends to capitalize on them and direct us to a better, future world.

Foresighting is seemingly finding itself in vogue these days, as it typically does in times of uncertainty and crisis (such as war). It also finds itself an attractive discipline where an organization finds itself in the throws of increased competition and needs to develop more discerning and meaningful ties to its stakeholders. These issues: of increased uncertainty, crisis and competition promise to be hallmarks of our times for many years to come. It then appears that foresighting might prove to be a technique that is deployed with greater or lesser degrees of formality in our efforts of creation, particularly at a time when the stakes seem very high. How do we change trajectories of our present day, where international harmony and wellbeing is under-threat, when the division between haves and have nots continue to grow, and the environment seems to be telling us that we've gone too far? This paper asks, What world do we want to create?, and how can we set about putting our new (and older) technologies at work to make it?

This paper will:

Examine the history and range of techniques used for foresighting in labs and organizations, with particular attention to trend spotting and analysis as applied to innovation in design and strategy.
Assert the value of foresighting in regional comparisons for innovation thinking that includes a sensitivity towards geographic, cultural, technological and user specificity.
Outline the application of foresighting to concept ideation and group decision making and ideal forging Present SMARTLab experiments as cases where trends are assessed and capitalized upon to create meaningful technologies that change lives for the better.

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Suzanne Stein is a thought leader in technology future foresighting. She leads the Mobile Platform Games Research Group for SMARTlab, and co-supervises the PhD cohort working on Accessible Technology and Personal/Community Fabrication (within MAGICbox). She has been a core member of the new technology division, Habitat, at the Canadian Film Centre, since its inception in 1997. She is currently faculty member and module leader for interactive media and narrative theory in their training programme and is a co-mentor for the Interactive project lab that runs across Canada, guiding and nurturing innovative technology projects for market launch. In addition to her work at Habitat, she has been a research and creative consultant to the IT sector for 7 years, forerunning and anticipating the importance of the new discipline of User Experience. Most recently, she led Nokia's research into the Oworldmap[1] for technology spread, and headed up some of their creative vision projects. She is working on a book about Future Visioning & Gender in the Technology Market, for the Emergenc(i)es series with MIT Press.

Stelarc
Alternate Anatomical Architectures: Extruded, Empty and Absent Bodies

The recent projects tentatively and imperfectly explore alternate anatomical architectures that incorporate physiologically plausible structures and re-wirings. They also postulate hybrids of biology and technology and actual-virtual chimeras. Operational and living systems as mixed and augmented realities. In so doing they expose the obsolescence of the body and questions its present form and functions. An EXTRA EAR is now being constructed on my arm. A left ear on a left arm. An ear that will become a remote listening device accessible on the net. A bodily feature has been replicated, relocated and rewired for alternate functions. With the PARTIAL HEAD project a digital transplant was done of a human face over a hominid skull. Printed as a 3D scaffold, the post-hominid, pre-human face had a layer of living skin grown over it. The WALKING HEAD is a 6-legged autonomous robot with a vertically mounted LCD screen imaging a computer generated head. It is engineered as a chimeric, actual-virtual system where its mechanical leg motions will actuate and modulate its facial behaviour.

1. BODIES
The body as an evolutionary architecture operates and becomes aware in the world. Its physiology has determined its philosophy.

The augmented body becomes an extended operational system, operating beyond the boundaries of its skin and beyond the local space that it inhabits. Altering the architecture of the body adjusts its awareness.

As surface, skin was once the beginning of the world and simultaneously the boundary of the self. But now stretched, pierced and penetrated by technology, the skin is no longer the smooth and sensuous surface of a site or a screen. The rupture of surface and skin means the erasure of inner and outer. Skin no longer signifies closure. It is not a site for inscription. It is rather a structure to be engineered. The body experiences itself as a hollow body, one that becomes a better host for its miniaturized and biocompatible implants.

2. FRACTAL FLESH
Extruded into electronic space, the body becomes empty. An emptiness not through a lack but the result of excess. A remote body not only to others but to its self. Its intimacy no longer a function of proximity but rather of its connectivity.

Fractal Flesh forms the electronic body: bodies and bits of bodies, spatially separated but electronically connected and generating patterns of recurring activity at different scales. Awareness becomes fluid and is experienced as neither all-here in this body nor all-there in that body but rather a multiplicity of bodies and parts of of bodies prompting and remotely guiding each other. Consider a task begun by a body in one place, completed by another body in another place.

Thus not only would a body possess a split physiology but it would experience parts of itself as automated, absent and alien. The abstraction of electronic space. The problem would no longer be possessing a split personality, but rather a split physicality. In our Platonic, Cartesian and Freudian pasts these might have been considered pathological and in our Foucauldian present we focus on inscription and control of the body. But in the terrain of cyber complexity that we will now inhabit, the inadequacy and the obsolescence of the ego-agent driven biological body cannot be more apparent.

3. FROM PSYCHO TO CYBER
Bodies must now perform in techno-terrains and data-structures, beyond the human-scale, where intention and action collapse into accelerated responses. Bodies acting without expectation, producing movements without memory. Can a body act without emotion? Must a body continuously affirm its emotional, social and biological status quo? Or perhaps what is necessary is electronic erasure with new intimate, internalized interfaces to allow a design of a body with more adequate inputs and outputs. It is now time to redesign the body to better match its machines.

A transition from psycho-body to cyber system becomes necessary to function effectively and intuitively and subtlety in remote spaces, speeded-up situations and complex technological terrains. Can a body cope with experiences of extreme absence and alien action without becoming overcome by outmoded metaphysical fears and obsessions of individuality and free agency? A body would thus need to experience its actuality as neither all-present-in-this-body, nor all-present-in-that-body, but partly-here and projected-partly-there. Feedback loops of split physiology, alternate awareness, and shared agency.

A body modularised, remapped and reconfigured- not in genetic memory but rather in electronic circuitry. What becomes important is not the body's identity, but rather it's connectivity- not its mobility or location, but its interface.

4. PHANTOMS
The realm of the post-human may reside neither in the realm of the body nor in the realm of the machine but rather in autonomous, intelligent entities embodied as images in electronic media. Potent and powerful phantom presences.

Bodies and machines are ponderous. They function in gravity with force and friction. Avatars are ephemeral and function smoothly, seamlessly and speedily in electronic space. Avatars are immortal. Images have no organs.
Tetsuro, Fukuhara
Space Dance in the Tube, Experience and Expression: how to get back the kinetic sense, how to express the unity in the space

Now we have a serious crisis that threatens our existence. As one characteristic phenomenon of information society, in Japan too, we face a difficult social condition where we can not judge the difference exactly between the real and the virtual. Now children sometimes kill their parents and friends very easy, because they can not feel the life as the important matter. In children's world the virtual reality is in progress, they lose the sense of reality. Also in adult's world, for example like the war in Iraq, the soldiers kill the opponents very easy by the high-tech fighters on the screen. For them the war is one of the games. The virtual reality is in progress still more, the value of the life is very light. In these conditions, how can we get back the needed kinetic sense and our life? How can we remake our safety living and how to create new designs using by these sensitive experiences for our society? This is our theme, with our project "Space Dance in the Tube".

"Space Dance in the Tube" is art & science, and dance & design project by the tube, intelligent robot, its virtual robot on the network, and interactive system using by real image and virtual image of our body. When people, from children to adult, come in the tube, very soon they can get back the kinetic sense. In short, in the tube at first everybody lose a posture soft, secondly they try to get back it desperately. The person who throws out his body naturally and makes a unity with the tube as one given environment is expert. In that time the tube support them using by strong repulsions with flexibility. Also, when they touch their images from inside in the tube which are projected by a video camera they can develop the ability to judge the difference between the real and the virtual. They know a way how to combine its two images correctly as wisdom of a new scienstic sense. At last they know that always human body needs the support from the space with enough information including virtual images for keeping their characteristic postures and personalities. And they can cultivate a new idea and a new concept for the design, keeping health, and environmental protection. Particularly we can find these themes in the fields of the Education, Space Development, Robot Development, and Cultural Development for the adult.

So we started to address our idea through "Space Dance in the Tube" to these four fields supported by Japan Aerospace Exploration Agency and Obayashi Foundation in Tokyo 2005. We joined "Science Agora 2006" supported by Japan Science and Technology Agency. January 2007 in Tokyo, we hold it at a Primary School with 440 students and Tama Science Museum, it was the talk of the town and TV news. So, now we will start our project supported by UNESCO, Ministry of Education & Science, and so on based on Tama Science Museum as our foothold. We will develop the tube as new intelligent robot and wearable suit to support our body with more amicable relationship.

Fukuhara Tetsuro is a director of Tokyo Space Dance. 1995, "East Winds Festival" in London secured his status as internationally known performer. 1998, He made "Digital Space Dance" supported by Japanese Ministry of Trade. 2000-2003 his appearances at many international cultural events: at MIT Media Laboratory, at the United Nations in New York, at "ISEA 2002", and at several foreign locations. 2004-2006 he worked on a study "Space Dance, Someday in the Universe" as a representative researcher with Japan Aerospace Exploration Agency, also he participated in "7th Space & Arts Workshop" supported by European Space Agency and Leonardo. 2006 at "UNESCO Prize for DigitalArts", "Space Dance in the Robotic Universe" was selected as "20 Projects in the World".

http://www.ne.jp/asahi/tokyo/sd/index_e.html
http://www.ne.jp/asahi/tokyo/sd/4_tubework_e.html

Thomas, Paul
Boundaryless Nanomorphologies

This paper investigates question of nanotechnological spatial boundaries by presenting the research gathered at the point of transition where the first atoms of skin meet the first atoms of gold. Boundaryless in the nano context means the opposite of having borders/boundaries, that develop an objectification of space.

Kate Marshall states that “The construction site of nanotechnology begins at the smallest level of the body and extends globally”. (Marshall 2004 p.157) The statement seeks to question; at what point do our bodies begin and how at atomic level do we define their boundaries? The borderless concept of transference that occurs at the body’s boundaries are an extension of the contemporary post human body. The space the body occupies and its humanistic boundaries can also be seen as being under threat through nanotechnologies. My investigation explores the architecture of our physical space at a nano level and our ability to comprehend the effects on scale and perception. Alfred Nordmann suggest that “This scientific way of relating to the cosmological image of nanotechnology abandons the claim of a privileged position for human being in a divine and externally fixed order”. (Nordmann 2004 p.50) As our preconceptions of space are reconfigured through the confrontation of Old World orders of spatiality via nanotechnologies the awareness of durational spatial boundaries is one of the most challenging study areas.

I will reference my own spatial investigation through the Midas project, which explores the space between at a Nano level creating a sonic visualisation of the transference occurring when humans touch a material. This research is achieved through the analysis of data recorded with an Atomic Force Microscope (AFM). The research focuses on questions of what happens between the touch and touched? What is transferred between the two? How does one affect the other? At what point does one object end in space and the other begin? How do we conceive of this at a particle level?
How do we define the boundaries and who maintains these boundaries?

The Midas project research is based in collaboration with SymbioticA Lab, University of Western Australia and the Nanochemistry Research Institute, (NRI) Curtin University of Technology. The project investigates the trans-mediational space between skin and gold’s surface. The collaboration enabled me to gather data of the activity of a skin cell’s atoms when touched with gold. The recorded data gathered from the AFM force spectroscopy cantilever as it touches the cell is picking up the surface vibrations. (In a low-noise environment, the AFM has the sensitivity to measure local nanoscale motion of cells. *Local Nanomechanical Motion of the Cell Wall of Saccharomyces cerevisiae* Andrew E. Pelling, Sadaf Sehati, Edith B. Gralla, Joan S. Valentine, James K. Gimzewski * Science 20 August 2004: Vol. 305. no. 5687, pp. 1147 – 1150 DOI: 10.1126/science.1097640 http://www.sciencemag.org/cgi/content/abstract/305/5687/1147) These vibrations are then translated into sounds files to use as the main resource in the generation of a sonic installation. The Midas project makes the infinitely small, audible and palpable. The paper highlights the infinite smallness and the extent that our perception of scale is of major importance in defining humanity.

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Paul Thomas, is the coordinator of the Studio Electronic Arts (SEA) at Curtin University of
Technology and is the founding Director of the Biennale of Electronic Arts Perth. He has been working in the area of electronic arts since 1981 when he co-founded the group Media-Space which was part of the first global link up with artists connected to ARTEX. Paul’s own practice lead research is in collaboration with the Nano Research Institute, Curtin University and Symbiotica, University of Western Australia. He is currently working on a commissioned public art work for the Curtin Mineral and Chemistry Research Precinct in collaboration with Woods Bagot Architects. He has recently completed his PhD researching a reconfiguration of space.

http://www.visiblespace.com

Triscott, Nicola
The Arts Catalyst

The Arts Catalyst's programme The Frontiers of Investigation (2004-6) aimed to extend spatial, geographical and cultural specialisation boundaries of artistic practice in the realm of scientific investigation. The programme has facilitated artists' work in international space agencies, remote research stations, observatories, sleep units and genetics labs, from Europe and Russia to India and Antarctica, resulting in the commissioning and presentation of several new artists' projects.

As the idea of art as a valid form of enquiry alongside science has gained weight internationally over the last decade, so Arts Catalyst has specialised in placing artists within hard-to-access fields of research and restricted environments. Motivated to contribute to changing attitudes and achieving a deeper understanding of the world, our projects raise questions about the technological, socio-political and environmental forces affecting life on earth and examine the cultural, social and political contexts of science.

This paper will track the processes and artists' projects in the three broad thematic areas of the programme: biotechnology, air and space, and environmental research.

Some of the projects the paper will discuss include Critical Art Ensemble's film Marching Plague, which recreated historic biowarfare sea trials to critique current developments in biowarfare research, Simon Faithfull's Escape Vehicle No. 6, in which the artist launched a chair to the edge of space, the Arts Catalyst's 2005 study for the European Space Agency to develop proposals for a cultural utilisation programme for the International Space Station (ISS), and the exhibition Space Soon: Art and Human Spaceflight, which included the commissions Gravity by Aleksandra Mir, Space on Earth Station by N55 and Neal White, and SpaceBaby by London Fieldworks.

Nicola Triscott is a cultural producer with extensive experience in the performing, interdisciplinary and visual arts. She set up the pioneering art/science organisation The Arts Catalyst in 1993. As Director of Arts Catalyst, she has commissioned more than 60 art projects that explore science and technology as transforming forces in culture and society. Her particular interests are artistic and cultural investigations of biotechnology, air and space research, ecological science, and research in remote environments. She led the European Commission-funded MIR project (2001-4), organising zero gravity flights for artistic and scientific experimentation with the Gagarin Cosmonaut Training Centre in Russia. In 2005, she was commissioned by the European Space Agency to undertake a study into future cultural utilisation of the International Space Station.
http://www.artscatalyst.org

Valdes Claudia X. / Thurtle, Phillip
From Spiderman to Alba: Transgenics in a Post-nuclear World

After the atomic bomb detonated over Japan in 1945, the world grappled to understand the significance of the event and its ramifications…what was the impact the nuclear bomb would have upon human life in a post-nuclear world? The A-bomb, still shrouded in military secrecy, existed as a looming question mark to be feared within the minds of world citizens. Cinema and comics responded to this anxiety and a new genre emerged: atomic science fiction, where radiation and nuclear fallout yield monsters and genetic mutants: giant ants, godzillas, shrinking men, sandmen, spidermen, and green hulks. Vis-à-vis media arts, these altered genetic life forms portrayed in popular visual culture since the 1950s, function as conceptual precursors to contemporary biological art and transgenic art and research. Such contemporary genetically amplified, hybridized and modified life forms, a.k.a. biological mutants, include Eduardo Kac's GFP Bunny, ANDi the GFP monkey, Stelarc's Extra Ear, and Art Orienté Object's work with transfused Panda blood. We suggest that superheroes and transgenics offer a form of immanent exploration of a post-nuclear world where social decisions are too complex to completely understand, technology too advanced to adequately control, and scales of experience too terrible to directly experience.

Phillip Thurtle is an assistant professor of the Comparative History of Ideas program and the History Department at the University of Washington. He received his PhD in history and the philosophy of science from Stanford University. He has co-edited with Robert Mitchell (English, Duke University) the volumes Data Made Flesh: Embodying Information (Routledge, 2003) and Semiotic Flesh: Information and the Human Body (University of Washington Press, 2002). He also co-edits with Robert Mitchell the book series entitled, In Vivo: The Cultural Mediations of Biomedicine. His research focuses on identity and biology in the American eugenics movement, the use of new media in popular science, the material culture of information processing, comics and the affective-phenomenlogical domains of media, and the role of information processing technologies in biomedical research. His latest book, entitled *The Emergence of Genetic Rationality: Space, Time, and Information Processing in American Biology, 1870-1920* (Seattle: University of Washington Press, 2007), documents the changes in experiences of space and time that allowed for the emergence of thinking in terms of genetics.

Claudia X. Valdes is an intermedia artist / educator concerned primarily with issues of trauma, time, memory, perception, and embodiment. Her research focuses on nuclear arms history, investigating scientific, previously classified military documents and media related material. Valdes received an MFA from UC Berkeley. Her work has exhibited internationally at venues such as: ICA, London; MCA, Chicago; WRO Center for Media Art, Poland; Exit Art, NY; and the National Centre for Contemporary Art, Moscow. She received an Honorable Mention at the 2006 Transmediale festival and a 2007 Artist Award from the Puffin Foundation. Valdes is Assistant Professor of Electronic Arts and the Associate Director of the Art, Research, Technology & Science Laboratory [ARTS Lab] at the University of New Mexico.

van Rijsingen, Miriam
Prolific Encounters: towards a Philosophy of Mutability

Mutability was a central issue in the art of Helen Chadwick in the late eighties and nineties of the last century. Her work questioned the “territories of prolific encounter”, mostly the body, and in later work also the embryo and the cell. The encounters could be between natural and (man-made) toxic materials, between beauty and economics, between natural law and memory, passion and desire, between the material and the digital or informational. The processes that ensued from the territories of prolific encounter she associated at one point in her oeuvre with viruses. In her “viral aesthetics” these processes are not considered as damage, but as potential, cultivating a possibility of change. Concepts of purity (or essentialism) and contagion no longer apply. Chadwick reworks the danger of the hostile into hospitality. Analysing Chadwick’s *Viral Landscapes* I will reconsider her ideas in the perspective of the art-science debate now, and reframe some questions about hostility, territory, frontier, difference and mutability.

In order to broaden the scope of research into a philosophy of mutability I will present three different artistic cases, projects from the 1990’s till now. These three examples are less about the human body, and more about ecological issues and bio-diversity. The first will be *Revival Field*, a project by Mel Chin from 1990, in which he used plants to clean up toxic earth. His project was pretty straightforward, targeted “on the mutable nature of (organic) materials”. The second case will be the projects of Brandon Ballengée, notably *The everchanging Tide* (2000-2001) and *Species Reclamation* (1999-onward). His projects are about the global disappearance of biodiversity caused by pollution, economic demand, climate change etc., studying declines and deformities in aquatic and amphibian species and also selectively breed, for example to re-establish certain species. Ballengée’s projects investigate the mutability and adaptability of species in the perspective of evolutionary thought and development.

The third case is Koen Vanmechelen’s project *Cosmopolitan Chicken (CCP)*, a project that started in 1998 and is and will be ongoing for years to come. The project is an extensive breeding programme with chicken breeds from all over the world. It will unite all chickens by cross-breeding chicken races from different countries to even out centuries of manipulation for purposes of commercialisation, consumption and patenting. The aim is diversity, to breed a “super-bastard”, a cosmopolitan super-hybrid. It’s 10^{th} generation now, is definitely stronger and healthier than its predecessors. Vanmechelen wants to evoke political, ethical and artistic debates, specifically on the domestication and production issue. But ultimately, this project is about mutability and evolution, or perhaps about the mutability of evolution by ‘allowing’ prolific encounters on a global scale.
I will evaluate these cases in the perspective of a possible philosophy of mutability, a rereading and re-evaluation of potentialities and adaptabilities of organisms to change and survive.

Miriam van Rijsingen, Ph.D.: art historian, assistant professor Art of the Modern period Institute for Art History, University of Amsterdam NL. Initiator and co-coordinator of the research program New representational Spaces: Investigations of Interactions between and Intersections of Art and Genomics. (Amsterdam and Leiden, 2004-2008), researcher synthesizing project: Signification and Experiment in Art and Genomics. Currently working on a book, Playing for Real. Subjunctive Spaces of Bio-art (preliminary title, to be expected winter 2008-2009). Co-director of The Arts & Genomics Centre, Leiden University NL, http://www.artsgenomics.nl. Working on collaboration projects and exhibitions in the Netherlands.

Vennard, Linda
From Imaging to Imagining: What Is Man Communicating about Himself through Nano-Art?

Science and art converge in nano-art, an emerging genre depicting the strange, miniature world of nanotechnology. Scientists are discovering and exploring a new world existing far below our perceptual abilities – the quantum regime. Significantly, the quantum regime is not directly accessible and we cannot directly experience it – feel it, see it, smell it, hear it, taste it - the sensual and affective dimensions are beyond our reach. The intellectual experience is all that is available.

To enter this directly inaccessible tiny world scientists use sophisticated computer image generating tools, such as the atomic force microscope. But scientists are not just physically exploring the profound and unique mechanical, chemical, electrical and optical properties of the quantum regime, they are also intellectually constructing a "nano-world". There is a progression from "imaging to imaging". Computer generated nanotechnology images move out of the laboratory into the social world, transformed into nano-art through increasing interpretive layers added by the social imagination. This space – the quantum regime - is becoming a "nano-world" into which man is projecting himself and his hopes, dreams, fantasies and challenges. Strategies of fight and escape from his fears are communicated through nano-art.

Yet man himself is curiously absent from this space.

Nano-art images reveal man's focus is himself, and the nanoworld is constructed from his perspective. All objects and activities operate from his perspective, organized around him and in his service and under his control. Nanobots are busy unclogging arteries, destroying viruses, repairing blood cells and cleaning teeth. Everything existing in the nanoworld is under man's control and dominance - there is no evidence of hurricanes, earthquakes or other disasters. Man has placed himself in the center of the nano-world, yet he is not present. Strangely, he is everywhere, but nowhere to be found. There is no ethereal ghostly presence or shadowy background figures in nano-world images; no fleeting glimpse or distorted reflection of man's face or body captured, perhaps inadvertently, in the shiny surface of some nanobot laboring in man's service. Man has not directly placed himself in nano-world images, but traces of him are everywhere in the objects and activities he is inventing and creating. He has projected his presence and asserted himself in the nano-world through his power, control and dominance. He is omnipotent and omnipresent, and simultaneously absent.

Man is discovering this world and dominating it through his presence. Nano-art images communicate man's search for his position in this space, and metaphorically represent his search for understanding his place in the universe. From the sublime to the sensuous, and the silly to the serious, man is projecting and expressing himself in all his complexity and emotional frailty into nano-art. The wide range of rich and diverse nano-world images communicate his challenges and strategies of escape.

Through a series of images and from a deconstructionist approach, specifically Derrida's "presence of an absence", I examine a wide range of nano-art images that delight, fascinate, amuse and inform us, and highlight representational practices to decipher and understand how man is projecting and representing himself in the nano-world.

Linda Vennard teaches and researches at the University of Calgary. Her expertise is impacts of advanced communication technology, with her research currently focused on national security and the transfer of intelligent networks from the military to public safety context. Linda's expertise includes broadband technology, scientific imaging, complex systems analysis and emergency communication. She teaches statistics, empirical research design & methodology, history of ICT, and national security, and she sits on University of Calgary Research Ethics Board. Her publications on nanotechnology include intellectual property, research and development, and social/ethical impacts.

Vesna, Victoria / Gimzewski, James
Blue Morph: Surges of Nanocellular Transformations

In this talk we will use the Blue Morph project as a way to address metamorphosis in nature and how we humans relate to change, specifically the paradigm shift that is upon us. Nanotechnology is changing our perception of life and this is symbolic in the Blue Morpho butterfly with the optics involved -- that beautiful blue color is not pigment at all but patterns and structure which is what nano-photonics is centered on studying. The lamellate structure of their wing scales has been studied as a model in the development of fabrics, dye-free paints, and anti-counterfeit technology such as that used in monetary currency. Blue Morpho has intrigued scientists for generations because of its subtle optical engineering that manipulated photons. Today, its dazzling iridescent wings are giving rise to a market trying to mimic its wonder and create a counterfeit proof currency and credit cards. The optics are no doubt fascinating but the real surprise is in the discovery of the way cellular change takes place in a butterfly. Sounds of metamorphosis are not gradual or even that pleasant as we would imagine it. Rather the cellular transformation happens in sudden surges that are broken up with stillness and silence. Then there are the eight pumps or “hearts” that remain constant throughout the changes, pumping the rhythm in the background. During the transformation to emergence each flattened cell of the wing becomes a nanophotonic structure of black protein and space leading to iridescence.

Nano is not only making the invisible visible but also changing our way of relating to “silence” or making the in-audible audible. With all the noise of chattering technologies and minds, we propose the interactivity to be stillness for in this empty space of nano we can get in touch with the magic of continuous change. But most of all we embrace the absurd and in a surge of laughter recognize our limited human viewpoints.

Biographical Notes

Victoria Vesna is a media artist, professor and chair of the department of Design | Media Arts at the UCLA School of the Arts. She is also director of the recently established UCLA Art|Sci center and the UC Digital Arts Research Network. Her work can be defined as experimental creative research that resides between disciplines and technologies. She explores how communication technologies affect collective behavior and how perceptions of identity shift in relation to scientific innovation. In her most recent installations she is concerned with the environment -- “Mood Swings” deals with the environmental effects on mental health and was exhibited in University of Washington, in a festival in Berlin and Castellon, Spain. “Water Bowls” aims to raise consciousness around the issues of pollution of our global life source and was exhibited in Beijing, Los Angeles and is currently at the Laboral gallery in Gijon, Spian. Other notable works are Bodies INCorporated, Datamining Bodies, n0time and Cellular Trans_Actions. Victoria has exhibited her work in 18 solo exhibitions, over 70 group shows, published 20+ papers and gave a 100+ invited talks in the last decade. She is recipient of many grants, commissions and awards, including the Oscar Signorini award for best net artwork in 1998 and the Cine Golden Eagle for best scientific documentary in 1986. Vesna's work has received notice in numerous publications such as Art in America, National Geographic, the Los Angeles Times, Spiegel (Germany), The Irish Times (Ireland), Tema Celeste (Italy), and Veredas (Brazil) and appears in a number of book chapters on media arts. She is the North American editor of AI & Society and editor of Database Aesthetics to be published by Minnesota Press in 2007.

James Gimzewski pioneered research on electrical contact with single atoms and molecules, light emission and molecular imaging using STM. His current interests are in the Nanoarchitectonics of molecular systems and cells with applications for nanomedicine. Recently, he has undertaken groundbreaking research in an entirely new field of biophysics, which he calls sonocytology.of living cells. In 2005 he published the most downloaded paper in Nature on a pocket sized nuclear fusion device. Gimzewski received the 1997 Feynman Prize in Nanotechnology, the 1997 The Discover Award for Emerging Fields, the 1998' Wired 25' Award from Wired magazine and the Institute of Physics "Duddell" 2001 prize and medal for his work in nanoscale science. He holds two IBM "Outstanding Innovation Awards", and is a Fellow of the Institute of Physics and a Chartered Physicist. Gimzewski was elected to the Royal Academy of Engineering, and he has joined the scientific boards of Quantum Precion Instruments, The Lifeboat Foundation and Veeco-DI Instruments and is a member of the UCLA California Nanosystems Institute, NASA Cell Mimetic Institute for Space Exploration and UCLA ART|SCI Center. With over 200 papers published, Gimzewski's research continues to appear in journals, such as Science, Chemical Engineering and Nature. He has also appeared in many popular magazines such as Discover Magazine, The New York Times, Wall Street Journal, and Scientific American. Currently he is a visiting professor at the University of Marseille II and Benjamin Meakin visiting Professor at the University of Bristol.

http://artsci.ucla.edu/BlueMorph

Willet, Jennifer / Bailey, Shawn
BIOTEKNICA: A Mutation Model for Teratological Art

BIOTEKNICA is an ongoing collaborative art/research project conducted by Shawn Bailey and Jennifer Willet – investigating the ethics and aesthetics at the intersection of art and the biological sciences.

In 2000, BIOTEKNICA developed a fictitious corporation, which projects its viewers into the future, where designer organisms are generated on demand in a virtual laboratory. The organisms produced by BIOTEKNICA, however, do not adhere to the structures and functionality normally manifest in nature. Similar to mutations depicted in *The Fly, Rosemary's Baby,* and *Alien Resurrection,* our specimens are irrational and grotesque. They are modeled on the Teratoma, an unusual cancerous growth containing multiple tissues like hair, skin, and vascular systems. Monstrous as this may seem, scientists today see the Teratoma as an instance of spontaneous cloning, and are conducting research on the Teratoma with the goal of developing future technologies. BIOTEKNICA both embraces and critiques biotechnology, considering the contradictions and deep underlying complexities that these technologies offer the future of humanity.

Since 2004 BIOTEKNICA has adopted a critical participatory methodology bringing our theoretical specimens out of their virtual environment and in to the laboratory. Serving as Research Fellows at the SymbioticA the Art and Science Collaborative Research Laboratory at The University of Western Australia, Willet and Bailey began preliminary investigations into growing tissue culture prototypes to serve as new representations of our product line. Here we commenced research with tissue culture protocols in the production of artwork as pioneered by Oron Catts and Ionat Zurr, of the internationally recognized Tissue Culture and Art Project, and SymbioticA founders. In 2006, we returned to SymbioticA – and working in collaboration with Cats and Zurr completed a new work entitled Teratological Prototypes.

This paper/presentation will present ongoing BIOTEKNICA research from a theoretical and practical perspective investigating mutation; mutation in terms of the teratoma – our object of study and artistic contemplation – and mutation in terms of our evolving artistic/research methodology situated in larger discourses of social and political activism and contemporary art.

Shawn Bailey is a practicing artist working with digital print media, video and installation. His current research explores notions of authority, control structures, media and international biotech and pharmaceutical policies. He is an Associate Professor at *Concordia University* in Studio Arts (Print Media) and an artist-researcher with the Hexagram Institute. Since 2000, Willet and Bailey have collaborated on an innovative computational, biological, artistic, project called BIOTEKNICA. BIOTEKNICA has been exhibited in various forms including installations at ISEA San Jose, USA (2006), *Break 2.3 New Species*, Ljubljana, Slovenia (2005), *Biennial Electronic Arts Perth* Perth, Australia (2004), *The European Media Arts Festival* Osnabrück, Germany (2003), *La Société des arts et technologiques* (SAT) Montreal, Canada (2005), and *The Forest City Gallery* London, Canada (2004), amongst others. In addition BIOTEKNICA has been presented in interviews and conferences at multiple venues across Canada, and in France, Australia, Scotland, Germany, Spain, Portugal, Serbia, Turkey, and Bulgaria. BIOTEKNICA research has been conducted during residencies at *The Banff Centre for the Arts* Banff, Canada (2002), and *SymbioticA*, The University of Western Australia, Perth, Australia (2004, 2006).

Jennifer Willet is an artist, a part-time faculty member in Studio Arts at *Concordia University*, and a PhD student in the Interdisciplinary Humanities program at the same institution. Her work explores notions of self and subjectivity in relation to biomedical, bioinformatics, and digital technologies with an emphasis on social and political criticism. She has exhibited and presented her research extensively across Canada and internationally. Since 2000, Willet and Bailey have collaborated on an innovative computational, biological, artistic, project called BIOTEKNICA. BIOTEKNICA has been exhibited in various forms including installations at ISEA San Jose, USA (2006), *Break 2.3 New Species*, Ljubljana, Slovenia (2005), *Biennial Electronic Arts Perth* Perth, Australia (2004), *The European Media Arts Festival* Osnabrück, Germany (2003), *La Société des arts et technologiques* (SAT) Montreal, Canada (2005), and *The Forest City Gallery* London, Canada (2004), amongst others. In addition BIOTEKNICA has been presented in interviews and conferences at multiple venues across Canada, and in France, Australia, Scotland, Germany, Spain, Portugal, Serbia, Turkey, and Bulgaria. BIOTEKNICA research has been conducted during residencies at *The Banff Centre for the Arts* Banff, Canada (2002), and *SymbioticA*, The University of Western Australia, Perth, Australia (2004, 2006).

http://www.bioteknica.org

Xiao, Leon Yongliang
Extending Human Life with Digital Art Forms

Digital art has become a major contemporary art form achieving acceptance from mainstream cultural institutions and academic disciplines. The new media arts not only empower our imaginations and expression abilities, they are also extending our human living space by removing restrictions from our physical world due to limited environmental resources. Never before that media technology supports the creativity in such broad area and art expression demands more advanced technologies widely. The combination of art and science is to enrich our life and to expand our world, both physically and virtually. A “Second Life” is where people can more freely express ideas and to live the way of their choice. Indeed, technology and art play different role in influence on our life. Technology is rule based problem solving tools that usually there are always limitations. These limitations restrict human life as per set. In the creative space, on the other hand, art is able to free ourselves and remove any restriction, and to help people to use their imaginations or to express feelings freely. Human being now can live in one real physical world and one virtual world. The later can be fully extended from the former, to double our living space and long lasting spiritual life.

In the long history of human being, science and technology can make people more powerful to deal with natural environment and to fight for our better life and living condition. Technology in this human-nature relationship is always used positively. On contrast, in the human-human relationship, often the times, technology is used by one group people to control or restrict the others. Art, nevertheless, is always positive sign of life, to help extending human’s ability to express ideas, to communicate, to influence, to help creating new life. Technique is hard and cold coded in nature, dealing with the external life; art is harmony indeed, warm and colorful for internal life.

This paper presents a report of research on the relationship of art and technology to extending human life. Great details will be given to discussion of the digital art forms, the role of technology in these forms, the nature of the digital art, and the philosophy of the digital life and virtual world. Special attentions will be paid to the virtual communities, mobile entertainment life, and networked art formats. Study cases will be selected mainly from China, a typical economic under developing country while technologically fully advanced. It intended to draw some conclusions that will keep awareness of the digital life and possible effects on our future.

Leon (Yongliang) Xiao, a digital media expert and art professor, is most proactive scholar of the field in China. He’s got his MA and Ph.D. in the United States and worked for 20th Century Fox and New York University for over ten years. After 20 years of learning and professional experiences in the States, he has recently returned to his home country, joining the country’s top ten university—Beijing Normal University, serving as the Art Professor, Vice Dean of the School of the Arts & Communications, and the Director of the Institute of Digital Media. He is the Chair of SIGGRAPH Beijing Chapter.

http://www.art.bnu.edu.cn

Young, Michael / Adderley, W. Paul
Here Is Now and There Is the Sound of the Land: Scientific and Sonic Perceptions of the African Sahel

This paper reflects on *Groundbreaking: Extreme Landscapes in Grains and Pixels*, a real-time generative installation commissioned from the authors by the UK Research Councils (1). The work interrogates visual and sonic representations of soil studies to reveal interaction and tension between extreme environments and cultural experience, between scientific understanding and contemporary soundart practice. The work offers a critique of scientific hierarchies; its assertions, assumptions and attendant aphorisms. Challenges to established hierarchies are embedded in science's history - Francis Bacon's *Novum Organum* still questions today's domains - and continue to resonate within debates about risk in science's future directions. Such a resonance is re-evaluated in processes of deduction, to link scientific assertion with societal comment, and abstraction, to link scientific modes of representation with artistic values of communication, visualisation and sonification (2).

People who live in geographically and socially marginalised areas, vulnerable to climate change, provide compelling impetus for this investigation. The Sahel is one such area, contrasting the desertified extremes of the Sahara with the needs of nomadic pastoralists and of settled agrarian peoples.

There are established deductive understandings of interaction between the environment and society at a regional- and local-scale; how people use (and used) the landscape to support their daily lives, how landscapes are managed to achieve this and influence the development of society (3). Repeated snapshots of the Sahel region offer one understanding, at least within subject domains entrained in sequences of similar studies: they suggest how adaptive strategies can be developed for the future of this region. Instead, we can break out of this entrenchment, investigate new forms of dialogue that examine atypical physical scales of human-landscape interaction. Evidence of human activity may be preserved in the sediment of an extreme landscape (4), and by examining these we gain an understanding of the nature and intensity of past human-landscape interactions in an extreme context, and a trajectory for the future.

This paper aims to further the comprehension of such interactions, reaching across barriers presented by different temporal and spatial scales: between landscape and the production of artefacts, between the scientific analysis of artefacts and their manufacture, between the perception of visual and sonified representations, and between micro-scale information and macro-scale evidence of extreme climatic change. In doing so, and with reference to the authors' installation work, novel understandings are elicited regarding the nature, scale and quality of the interfaces present.

Paul Adderley is a soil scientist with interests in geoarchaeology and environmental history. An RCUK Academic Fellow at the University of Stirling, Scotland, he specialises in the sustainability of societies in extreme environments such as Greenland and the African Sahel; he lectures on topics surrounding environmental risk. Recent studies have centred on understandings of long-term societal-climatic interactions.

Michael Young is a composer with interests in computer music and interactive media. He lectures at Goldsmiths, University of London and cofounded the Live Algorithms for Music network http://www.livealgorithms.org. Recent compositions include Aur(or)a, a generative system for solo instrument and computer (2006) and Argrophylax (2005) for oboe and electronics. http://www.myoungmusic.com

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Zaretsky, Adam
On Mutaphobia

A brief analysis of the attractions and repulsions, responsibilities and sociopathologies which are coincident
with the transgenic designer's arena of sculpting inheritance.

"We could even have new genitals, new senses, new brains, new consciousness and, if you can imagine a post-gender, post-race, post-anatomically determined world, we would have new romance possibilities. Let's remember that if some people want to look like fashion models, other people will always want to look like turtles and have a shell so they can crawl into it. A shell will help post-humans be radiation resistant and avoid getting clobbered by a horde of eugenic-transgenic brutes with no sense of inherited integrity."

How do we decide what difference is worth engineering for?

In particular, all living organisms can be designed materials along a wide variety of aesthetic gene expressions. Considering the range of gene expressions possible in a collage of multiple genomic pallets, economic efficiency is neither a simple concept nor our only deciding force. Beyond public acceptance of the technology, there is also public trend diversity, novelty markets and niche power to be brokered in this global competition for more unusual entities. We need to explore the entire range of trans-clonables and widen the variety pool to include gourmet, abject and non-utilitarian breeding projects.

What can Extremophilia tell us about Designer Baby Anatomical Potentialities?

Mutant survivability in extreme environments is both a palette and a method for new reproductive products and children. If the technology for genome sculpting of new style humans is a possibility, what, if any, effect will imagination play in our future kindred? How are artists, scientists and creative non-humans taking these factors into account as they try to express themselves through living collage of life as a sculptural material? As new biological comprehension sprouts new technological processes, what are the overt and covert roles of creativity on the decisions of which traits get embedded into whose new bodies? Is sexual selection representative of gene excess in expression? Is there any biodiversity that is not partly a fetish for Extremophilia? Anatomies survive to represent time honored polymanias, retro but passionate in their day. Therefore, anatomy represents a remainder of perverse perseverance beyond pure fitness strategies.

What are the cultural aesthetics of our ecological future?

Has environmental habituation found us breeding for utilitarian traits while dreaming of excess? The decision to design transgenic organisms along a plurality of aesthetic lineages may have an impact on the future of ecology and diversity of our planet. As competitively designed, bio-mediated beings take up more and more of the terrestrial grazing land, we have come to understand that we live on a planet more and more dominated by humans and their engineered familiars. Designed and cloned livestock, pets and wildlife are limited editions but they can reproduce independently. Industry animals, transgenic insects, semi-humans and genetically modified plants may be foreign species brought forth from technology but are they seductive enough for us to want to live with them for generations to come?

Adam Zaretsky is a Vivoartist working in Biology and Art Wet Lab Practice. This involves biological lab immersion as a process towards inspired artistic projects. His personal research interests revolve around life, living systems, exploration into the mysteries of life and interrogating varied cultural definitions that stratify life's popular categorizations. He also focuses on legal, ethical and social implications of some of the newer biotechnological materials and methods: Molecular Biology, ART [Assisted Reproductive Technology] and Transgenic Protocols. Zaretsky also teaches Vivoarts: Ecology, Biotechnology, Non-human Relations, Live Art and Gastronomy. Focus is on artistic uses and the social implications of molecular biology, tissue culture, genomics and developmental biology.

http://www.emutagen.com
http://www.pfarm.org/ussmeac.pdf
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