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EDITORIAL

Art and Weightlessness: The MIR Campaign 2003 in Star City

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In April 2003, a group of artists, scientists, theoreticians and art-managers from different European countries (the U.K., Slovenia, Russia, France and Spain) spent one week in Star City near Moscow, at the Gagarin Cosmonaut Training Center, to undertake parabolic flights for artistic purposes and to work with some of the center facilities, such as the centrifuge and the archives.

This project, led by the London-based art-science agency Arts Catalyst and the Slovenian-based Projekt Atol, is the result of a joint collaboration between several art organizations that formed, in 2000, the MIR Consortium (MIR stands for "Microgravity Interdisciplinary Research"). The MIR Consortium includes the above-mentioned organizations, as well as Leonardo/OLATS in Paris, V2 in Rotterdam and The Multimedia Complex for Actual Art in Moscow.

As having artists in the Space Station is still a dream, the only way to experience weightlessness is through parabolic flights, in which each parabola offers 25 seconds of zero-g (zero-gravity), "framed" by 25 seconds of 2-g.

Space art has long been an interest and focus of *Leonardo,* and art and microgravity - that is, art created and experienced during the week at Star City - is one of the sub-categories of this field. Far from being just an "extreme physical experience" or a "marginal art practice," this project, like previous ones, has led to major artistic issues as well as promising, challenging new artworks. We are proud to publish in this month's LEA the reports of many of the participants.

More links and contents are provided on the Leonardo/OLATS web site, at: http://www.olats.org/setF3.html

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FEATURES

The Multidisciplinary Research Laboratory

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The Arts Catalyst, a U.K. science-art agency, facilitates artists' engagement with science and promotes dialogue and collaboration between artists and scientists. Our specific interest is to develop new and emerging areas of

artistic/scientific work, such as zero-g art, space projects, extreme environments and life-based systems, breaking new ground in promoting artists' engagement with high-profile and sensitive areas of investigation.

Fundamental to this work is the need to facilitate in-depth research projects by artists working with, as, or alongside scientists. The research we wish to promote focuses on artists' use of scientific processes and equipment and on developing dialogue between artists and scientists, through opening up new or unusual opportunities for artists and scientists to undertake research alongside each other and through facilitating multidisciplinary research groups.

Since 2001, we have set up three multidisciplinary research laboratories to explore new ways of promoting dialogue and understanding between artists and scientists. These laboratories are either geographically remote or remove the participants from their usual society in some other way. In the laboratories, artists and scientists work as a group, pursuing their research projects together. Our vision was that an exchange of ideas and expertise would take place through the social and work situation in which the participants would find themselves, spending most of the hours of the day together over a period of time.

Laboratory 1: MIR Flight 001 Russia

Our first "laboratory" took place in October 2001 in Star City in Russia. With the Gagarin Cosmonaut Training Centre and in association with Projekt Atol Flight Operations, Arts Catalyst was able to take a group of U.K. and Russian artists and scientists and a Russian philosopher (16 people in all) to experience and undertake projects in zero gravity on a "parabolic flight" (a diving aircraft) and to film and experience the atmosphere of Star City.

Here is what one of the artists wrote about his experience:

"I would like to say something about the team of people I traveled with. The camaraderie and bonhomie generated was unique. There was a definite sense that new, inspirational relationships were being forged. Given the wide divergence in these various practices, there was a lot to talk about with, and learn from, every other member of the group. I found myself almost constantly embroiled in conversation. The informal settings and mobile nature of these conversations, extending over a week, contained by a communal "rite of passage," made them quite different from the conversations that might happen at conferences, seminars and formal meetings. These encounters were perhaps the most valuable aspect of the whole trip for me." - Ansuman Biswas

Laboratory 2 - Makrolab Mk 2 Scotland

Makrolab was envisioned by Slovenian artist Marko Peljhan as an autonomous research and living environment, powered by sustainable sources of energy (solar and wind power) and designed for a long existence in isolation. His vision for Makrolab is for a true art-science research station, able to function in a variety of climates with the long-term goal of a permanent art-science research station in the Antarctic.

Arts Catalyst sited Peljhan's Makrolab in the Scottish Highlands in Summer 2002, as part of the International Year of

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Mountains (IYM). Twenty-one artists and scientists lived and worked together at the site over a period of 3 months - in groups of 4-6 at a time - remote from civilization, but connected via satellite links. Our scientific collaborators at the site were particularly interested in the potential of the Makrolab to help advance current thinking about "footprint-light" research in fragile changing ecologies. In this thinking, "gateways," in the form of sustainable research stations, are sited at the boundaries of fragile environments. These enable researchers to undertake study programs of varying duration, making controlled excursions into the local ecology, while disseminating information in the local area and internationally.

Laboratory 3 - MIR Campaign 2003 Russia

Our most recent laboratory, in April 2003, again revisited the Gagarin Cosmonaut Training Centre at Star City and the parabolic flight experience, this time drawing on the knowledge gained from our participation in a European Space Agency parabolic flight campaign.

This time, we selected seven artistic and scientific projects from several countries in Europe and took a group of 20 (artists, scientists and accompanying curators) on a working trip to Star City for 8 days. During this time, the participants socialized, ate and planned together.

Participants undertook two parabolic flights with the Gagarin Cosmonaut Training Centre. A 6-parabola flight allowed those undertaking projects in weightlessness (all for the first time) to experience and adjust to the microgravity environment and test their projects and equipment. A 25-parabola flight then enabled the full project work to be undertaken. An artist's project was also undertaken on the giant centrifuge at Star City, and participants also explored the museums, archives and environment of Star City. Several of their projects are explored later in this journal.

Conclusions

These experimental laboratories are a new model to foster long-term links between artists and scientists from different countries and different disciplines. In the short-term, the results are certainly encouraging, with collaborations emerging between participants after the laboratory experience. Inevitably, as arts-led projects are not immersed in the structured world of the scientist, it has been more difficult to attract strong scientific proposals than art proposals and this has resulted in an imbalance of the two disciplines represented in the laboratories. Attracting more, stronger scientific proposals remains a challenge, and linked to this is the challenge of finding or creating laboratory situations unique enough to attract the scientist as well as the artist.

Biography

Nicola Triscott is director and founder of the Arts Catalyst, a U.K. science-art agency (www.artscatalyst.org), which she set up in 1993 to promote dialogue, exchange and collaboration between artists and scientists. Arts Catalyst's mission is to extend, promote and activate a fundamental shift in the dialogue between art and science and its perception by the public. The organization works nationally and internationally, pioneering new territories and venues for artistic practice, including nuclear science, space exploration, biotechnology, global

systems, theoretical physics and setting up multidisciplinary research laboratories, such as the zero-gravity flights. Nicola has initiated and organized with colleagues three parabolic "zero-gravity" flight campaigns for scientists and artists with the Gagarin Cosmonaut Training Centre, Star City, Russia, and she is also a co-investigator of science and movement experiments on European Space Agency parabolic flight campaigns, with choreographer Kitsou Dubois and scientists from Imperial College London.

Nicola studied physics and political geography at university and, from 1985-1993, worked as an arts producer and administrator in a wide range of sectors, from commercial theater production to community arts, before setting up Arts Catalyst 10 years ago.

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An Artist in Space - An Achievable Goal?

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How possible would it be to actually send an artist into orbital space? This question leads to a number of debates, both practical and theoretical.

The success of the last two space-tourists flying with the Russian Space Agency to the ISS (International Space Station), Dennis Tito and Mark Shuttleworth, leads those of us involved in promoting greater contact between the cultural area and space agencies to ask the question - if an arts organization could raise that amount of money, could they train and launch the first artist-cosmonaut in the same way, that is on a paid third seat on the Soyuz craft, and if so, would it be desirable?

The questions that jump out to anyone entering this arena are quite obvious, but need to be answered:

Why, when it is so hard to do science in space already, with cutbacks on the ISS and the Columbia space-shuttle disaster already putting pressure on the existing operations, should the seeming luxury of sending an artist take priority?

How much would it cost, and wouldn't it be a terrible waste of money?

Assuming the money could be raised, who would go? What would be the artform, age, sex, race and nationality of the successful artist-cosmonaut and how would we select her or him?

The first of these points would be raised by the scientific community and echoes initial concerns about artists using parabolic flights for the work. The hard fact is, as The Beagle Mars lander team demonstrated in their somewhat staged 'collaboration' with the U.K. artist Damien Hirst, that culture is good publicity for the space industry. Artists and cultural figures have some kind of influence on the public consciousness and the political will to invest in space travel can be affected by this. Not only this, but artists may have something to contribute to the direct experience of living in space, as Kitsou Dubois has shown in her dance training work with the Centre National de la Recherche Scientifique (CNRS) and the European Space Agency (ESA).

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How much would it cost? Well, the exact figure that was paid by the last two space tourists to the Russian Space Agency is not known, but it is thought that around 18-20 million dollars changed hands for Mark Shuttleworth's flight. He claims on his website that this is less than most countries would pay for their own astronauts to go (presumably excluding Russia). Over, say, a five- to ten-year period, this is the kind of money that middle-scale arts organizations might raise for a building project, applying to corporate trusts, holding benefits, art sales, national lotteries - even some kind of public funding on a transnational basis. That said, it's a lot of money to burn over a 10-day mission. One possibility might be to use cultural contacts with the Russian government to try and lower the price, but this would need to be done well in advance of the mission, and would require strong political support. The unfortunate pop star Lance Bass found himself thrown out of Star City when his funders tried to bargain with the Russians mid-training.

Who would go? It is clear that the artist chosen would have to take the work of other people, whether that would be in the form of a physical project or a performance or a conceptual experiment. She or he would have to be in good health, not too old (but this has become less important). They would need to be DETERMINED to go, and probably backed up by a team of other trained artist-cosmonauts ready to take their place, as happens in regular launch training. So there would have to be committees of experts, and perhaps voting and, of course, all interests would want to be represented, which is one of the less interesting aspects of this line of thought-experiment. The Arts Catalyst, member of the MIR European network and organizer, with Projekt Atol, of three Russian zero-gravity campaigns, has had the idea of commissioning new projects to be done or taken by the artist-cosmonaut, to be exhibited in the Roundhouse in London in 2005. This could lead to a 5-year campaign to raise funds to send the projects in 2010 or later.

The aim of this would be to spread a kind virus of an idea around the world, at least, that the aim of an artist in space is possible. If they decide to go ahead with this, the call for proposals will be in the spring of 2004. Your initial responses are welcome on: http://www.artscatalyst.org

Biography
Rob La Frenais is a contemporary art curator and writer living in London, England and Albi, France. Trained as a journalist, he became involved in the art and community video scene in the 1970s, and participated in early media art exhibitions in Europe and internationally. From 1979 to 1987, he founded and edited *Performance* magazine, a key international cultural journal that charted the explosion of performance art in the 1980s. From 1987, he became a curator, specializing initially in performance and site-specific sculpture and installation, producing three major international biennales, with new commissions by over 100 artists in London, Newcastle, Glasgow and Madrid. In 1993, he curated Earthwire, an exhibition of art and technology in rural sites. From 1994 to 1995, he was the artistic director of the Festival de Belluard, Fribourg, Switzerland, with a theme of artists working with consciousness, which later toured to the ICA, London. In 1996, he worked with artist James Turrell to develop a new major site-specific work in the North of England. In 1997 he joined the Arts Catalyst, the science-art agency, as curator and developed and produced a number of major initiatives involving nuclear art (Atomic), space exploration in art

(Gravity Zero, Artists and Cosmonauts), indigenous science (Parallel Universe), new living systems for artists and scientists (Makrolab in Scotland) and art and biotechnology (CleanRooms). He has organized and chaired a number of conferences and forums (Eye of the Storm, Cosmic Chances, UK Space Art Forum, Working With Wetware). With the Arts Catalyst, he has organized four zero-gravity campaigns, in Star City, Russia and Bordeaux, France. He participated in the first dedicated artists zero-gravity flight in the Ilyushin MDK 76 in Russia with Noordung/Projekt Atol in 1999.

He will not be going into space until the technology improves.

Projekt Atol Flight Operations And The MIR Network

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Projekt Atol Flight Operations (PA-FO) is a branch of Zavod Projekt Atol, an independent arts and research organization based in Ljubljana, Slovenia. Zavod Projekt Atol was founded in 1994 and manages diverse projects such as the Makrolab (http://makrolab.ljudmila.org”) and the Insular Technologies initiative, among others. PA-FO was founded in June 1999 to organize and support the parabolic flights of the Cosmokinetical Kabinet Noordung performances, *Biomehanika Noordung,* in conjunction with the Gagarin Cosmonaut Training Centre (GCTC) in Star City, near Moscow.

PA-FO organized a training flight in August, 1999 and two performance flights, with eight members of the public, for a total of 16 on board, in December, 1999. The aircraft was equipped and safety-checked in three days, which was possible only due to previous planning and further safety modifications of the experimental load. The two December flights took place successively, after refueling and change of the public crew members. PA-FO oversaw coordination of the flight, safety, systems and logistical plans, as well as the crew and guest-crew on board the experimental aircraft. They also installed flight-grade equipment, together with specially designed seats for the public, capable of sustaining accelerations of up to 10-g (ten times the force of gravity). The design of the seats and set was done by the Noordung design team, with Stasa and Dunja Zupancic, together with Andraz Torkar, while the safety modifications were done under the review of Captain Stepanov of the GCTC. The flights were organized within the GCTC structure and under the responsibility of the cosmonaut training department, headed by Col. Grekov and Col. Ren, with Capt. Stepanov as the main liaison and Col. Irina Sokolova as interpreter and crew-training officer.

The *Biomehanika Noordung* performances (directed by Dragan Zivadinov), which took place during both the August and December flights, were based on the dramatic body and bone transformation that takes place in microgravity, but were also part of the larger and more complex aesthetic mythology created by the author within the context of his Cosmokinetical Kabinet Noordung group. The training flight was designated as the “farewell ritual” for Marko Mlacnik, an actor taking part in the “50-year project” - a project of launching 16 small GEO satellites that will serve as “substitute actors” until 2045 (farewell rituals

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are short dramatic forms that are to take place between the repetitions of the 50-year performance cycle, and in the case that some of the actors in the piece die as the performance evolves, they will be replaced by satellites - "substitute actors"). The performative structure was based on a scientific text discussing bone transformation due to the effects of prolonged microgravity.

Seven actors participated in the performance, which was viewed by 16 members of the general public. This was the first microgravity theater performance in history and was documented and filmed by Andrej Lupinc and his crew for a feature documentary being produced by Kinetikon pictures, Projekt Atol, RTVS and other co-producers. The documentary is being directed by Michael Benson and has the working title, *Zero.*

These first flights served as the initial push for the foundation of the Slovene Space Agency, an initiative to start an independent research agency in Slovenia, which would combine the work of artists and scientists in space and thus provide a unique opportunity and perspective. This is the first institution of its kind in the country. The initiative was presented to the wider public in Slovenia in the spring of 2001 and work on its institutional framework is proceeding.

Guests, including Rob la Frenais, Arts Catalyst curator [see previous article - Ed.], were invited onto the first training flight, and this visit prompted discussion regarding further collaborations on microgravity parabolic flights between PA-FO, GCTC and Arts Catalyst. The idea for the establishment of the MIR network was thus born. The network's name (which stands for Microgravity Interdisciplinary Research) clearly defines the goals, while the acronym makes reference to the Russian Space program and the late MIR space station which was, in its last years, a truly international program. The MIR station was finally de-orbited on 23 March, 2001.

After these initial flights, further flights were organized, one in the spring of 2001 for the Kitsou Dubois team and another one - the first MIR flight - in September of the same year, consisting of a mixed British, British-Caribbean and Russian crew. A presentation of the initial PA-FO flights already took place in V2 (see V2_Organisation, Institute for the Unstable Media, (http://www.v2.nl/index.php) in the spring of 2001, with MIR
being born soon afterwards as a collaborative effort between Arts Catalyst, V2, Leonardo-OLATS, Projekt Atol, and the Multimedia Complex of Actual Arts, Moscow. Two MIR flight campaigns have been organized up to now, one in 2001 and one in 2003.

PA-FO is also continuing its work of coordinating the design and launch of the Artjom-MM LEO satellite, designed by Dunja Zupancic and Laurent Paul Robert, with a communications and remote-sensing payload. The satellite is tentatively planned for launch in 2009. The Artjom-MM project is conceptually part of the GEO activities planned by the Cosmokinetical Kabinet Noordung group, with this first LEO satellite introducing the concept for further developments until 2045 (when the project is planned to end). This satellite will also be the first Slovenian Space Agency satellite project and is planned to serve as a communications and remote-sensing asset of the world tactical media community. The launch is planned in conjunction with the Makeyev design bureau and possibly the AMSAT organization. Talks

on defining the satellite began in 2002.

All this said, independent or independent-based access to space and space assets, as well as their cultural, creative and tactical media use, is seen as a crucial development, both in technical and political terms, for the next decade of space operations, since the transnational nature of the space and orbital expanses has to be used to the benefit of humankind in its totality. Projekt Atol Flight Operations plans to join forces with all institutions and individuals interested in furthering these goals and to actively work on accessing and understanding space-related technologies and paradigms, through the activities of MIR as well as through collaboration with space agencies and space-related technology and policy organizations.

Biography

Marko Peljhan studied theater and radio directing at the University of Ljubljana and in 1992 founded the Projekt Atol arts organization, in the framework of which he works in the performance, visual arts, situation and communications fields. In 1995, he founded the technological branch of Projekt Atol Pact Systems and in 1999, Projekt Atol Flight Operations. In 1995, he co-founded Ljudmila (Ljubljana Digital Media Lab) and from 1996 on worked there as a program coordinator in many different fields. He is coordinator of the international Insular Technologies initiative (www.insular.net) and the Makrolab project (makrolab.ljudmila.org), as well as being flight director of the parabolic flights with the Yuri Gagarin Cosmonaut Training Centre in Moscow. In 2001, he became a member of the strategic council for information society, established by the government of the Republic of Slovenia. He also invented and coordinated the production of a mobile media-lab project, *Transhub-01,* which was first realized as *Mobilatorij* in 2002.

His work has been presented at major international exhibitions, such as Documenta X in Kassel, the second Johannesburg Biennale, Ars Electronica, Media City Seoul, Gwangju Biennale, Manifesta and Venice Biennale. In 2000, he received the special Medienkunst prize at the ZKM and in 2001, the Golden Nica Prix Ars Electronica together with Carsten Nicolai for their work, *Polar.* He is currently professor in Art and Digital Media at the University of California, Santa Barbara and the director of Projekt Atol.

Contextualizing Zero-Gravity Art

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There are a number of contexts within which zero gravity can be discussed. At one extreme, we can try and develop the arguments for continuity with previous human and cultural exploration, or we can emphasize the discontinuity and potentially revolutionary nature of such work. It is only through the growing body of work by artists in zero gravity that a theoretical frame can be elaborated.

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It is straightforward to connect zero-gravity art to a number of artistic movements or tendencies, which build not only on art theory and practice over the last 150 years, but also on the work of a number of "outsider" artistic figures whose work has never been seen as central to a history of modern art.

Zero-gravity art can be seen within the framework of the cultural appropriation of public and private spaces to create site-specific art that in some way invests these spaces with meanings that are alternative to or deeper than those normally associated with them. In this case, the artists must attempt to understand the specificities of the space, both physical and ideological, and use these to create an "actual art" that could not be realized in some other space or time. These explorations then explore both the continuities of the space with spaces already invested with cultural meaning, and the discontinuities that make possible original experiences.

On the ideological level, it is striking that artists' access to zero-gravity spaces has accelerated with the end of the Cold War and the increased search for a new political and economic rationale for space activities. This evolving political and economic rationale for space has re-opened links between space activities and various space utopias such as cosmism or the "space option." These cultural arguments dominated much earlier thinking about space, both in science-fiction literature and artistic expression, before the Space Age opened with Sputnik, Gagarin's flight and Armstrong's first human steps on the Moon. But the Cold War context put such cultural arguments in the background as arguments related to themes of military, political and economic competitiveness dominated until the 1990s. However, as political support for space activities has weakened, the utopian cultural framework re-emerges into the foreground. It is unlikely that a sustained human presence in space can be sustained without a much deeper grounding in the cultural imaginary [1].

Zero-gravity art is also naturally contextualized within the history of artistic avant-garde movements and exploration of experiential or social novelty. We can find natural links with the way that artists have steadily acculturated other technologies into the artistic vocabulary (photography, radio, computers, the Web) as well as artistic exploration of novel or extreme human perceptual and conscious experience (hallucinogenic drugs, meditation, extreme environments). Zero gravity then enters as one of a variety of possible human experiences as a possible trigger to specific or amplified meaning.

In some of the utopian literature, human presence in space is viewed in continuity with the history of human migration from the human origins in the African continent. In the argument of the "space option," this migration is argued as not only responding to an innate human propensity for exploration, but also to provide economic and social solutions that both allow for sustainable development on Earth and provide a locus for future growth and survival on timescales longer than the Earth can provide as a homestead.

This context of human migration, however, minimizes the very real discontinuity in the nature of the physical environment. Human migration to other terrestrial continents required adaptation (architecture, clothing, diet) to climates and

conditions significantly different from those where the human animal evolved. However, even in the most extreme environments, such as the Antarctic or high altitudes, this could be accomplished using technologies and methods that did not significantly change human metabolism or development or drive evolution of the human genome significantly. Today's humans are not very different that those that first migrated out of Africa.

However, outer space is not an environment that can be viewed as a smooth continuation of existing, or even extreme, environments on Earth. The conditions of zero gravity, disconnection from diurnal cycles, the vacuum and radiation are incompatible with human existence, except through the elaboration of complex exoskeleton systems and changes in human metabolism and anatomic development. It seems illusory to imagine long-term human existence in extra-terrestrial environments without discussing driving evolution of the human genome itself.

Today we know of some two dozen artists who have created artistic work in zero-gravity environments. The total accumulated lapsed time of all these artists' experiences is of only a few hours at most. This is the situation that computer artists found themselves in during the 1960s - since then, artists have acculturated the computer into a powerful and flexible tool and medium for human expression. Perhaps 50 years from now, zero-gravity artists will also find themselves in this situation, but this will only occur if human presence in space develops rapidly, with a sustained political and economic support that does not exist today. If the discontinuous nature of zero gravity prevails, then in a 1000-year history of human culture, zero gravity will appear as a footnote in a history of "information arts" [2], just as the "linoleum art institutes" of the nineteenth century are now relegated to mere footnotes in the history of art and technology.

Since the 1960s, the Leonardo network and its associated publications and workshops [3] have provided a forum where space-art could be presented and advocated as a necessary part of the culture of the future. Through the MIR Consortium, *Leonardo* is seeking to help open space to artistic experimentation as one way of helping re-connect space activities to the cultural imaginary; I remain convinced that without this fundamental re-connection, the Space Age will come to an end in our lifetime and our political institutions will "burn the space ships," just as in an earlier time, a Chinese emperor burned his fleet and prevented Chinese circumnavigation of the globe. There is nothing inevitable about the future, and zero-gravity artists are, in their way, helping us to imagine other futures.

References

1. Since the late 1980s, the International Academy of Astronautics (http://www.iaanet.org) has, through its Space Activities and
Society Commission (and earlier with its Art and Literature committee), provided venues where artist's rationales and involvement in space could be advocated.

2. Steve Wilson, *Information Arts: Intersections of Art, Science, and Technology*, MIT Press, Cambridge, MA, 2002. Wilson elaborates at length on the variety of new technologies and scientific environments that artists have explored and invested.

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3. The *Leonardo* Journal has published over 50 articles by space artists. See the space arts bibliography and access to the *Leonardo* publications at - http://www.leonardo.info. Also, through the Space Arts
Workshops , Leonardo/OLATS (http://www.olats.org), *Leonardo* has provided a venue where
space artists, scientists and engineers could meet and initiate collaborations.

Biography

Roger Malina is an astronomer and editor. He is Director of the Laboratoire d'Astrophysique de Marseille and Executive Editor of the Leonardo publications.

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an Art Critic in Microgravity

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I am an art critic, researcher and teacher in the field of art, science and technology, space art being one of my fields of research and expertise. I have always found it difficult, at some point, to write or talk about something I don't know, about something of which I have no direct experience. It is often said that when it comes to art, artworks should "speak for themselves." In this case, then, it is the task of the artists to transmit the experience of microgravity, especially as very few people, if any, in the audience will have such experience. However, I found it difficult to go deeper into my research and thoughts without "knowing" what it was like to experience zero-gravity (zero-g) and to create artworks in the conditions of parabolic flights.

I had a totally "intellectual" vision and perception of parabolic flight and zero-g, acquired through many hours of watching videos of previous flights and having in-depth discussions with choreographer Kitsou Dubois, who has also collaborated on these projects. I "knew" that the movements of the body were different under such conditions (i.e. the spinning of the body, where any joint can become a potential axis), as was one's perception of it ("floating", the necessity of self-referencing, etc.). I also had the mistaken vision of a "silent" flight, since the real sound of the plane is always edited out in videos, which is totally misleading.

My first discovery was that there is a difference between zero-g and parabolic flight: zero-g is a specific environment within another specific environment, which is the flight. Both are interesting in themselves, but they have to be dealt with in separate ways, depending on what one wishes to focus upon. Parabolic flights are environments that include the time-rhythm of the parabola, with its short alternating sequences of 2-g, 0-g, 2-g, followed by a longer sequence of 1-g; the noise/sound (in the Cagean sense) of the plane and of the announcements of the pilot; the rhythm of lights and of the expansion/compression of the body; the other people around (the duality/dialectic of others' perceptions and the isolation centered on oneself, although this last statement may be because it was my first flight).

My main discovery, however, was that the parabolic flight is an environment to work in for artists, a kind of "atelier," or workshop (where the process of creation partially takes place), as well as an environment to work with or about.

Before this experience, I put all "zero-g" art into a single group. After the flight, I can start drawing a typology, which is split into three main categories:

1. Parabolic flight as the atelier, the artist's workshop or rehearsal place

The flight is here seen as the rehearsal place for an artwork that is to be created and perceived on Earth. It is thus a place to experiment zero-g, to test hypotheses and ideas, to modify them according to experience, to gather material for a piece about (being in) weightlessness, a place to work in. This category seems to include the most important works: those by Kitsou Dubois, Marcel-Li Antunez-Roca, Kodwo Eshun, Anjalika Sagar and Richard Couzins, by video artists, etc.

2. Parabolic flight as the "stage of the performance": an artwork *for* the zero-g environment

Those works are created within the zero-g period and are "achieved" within the flight. Since going to a space station is still something difficult for artists, the flight acts as a surrogate arena. The work is *for* the zero-g environment, while the documentation about the work (pictures, movies, writings, etc.) is the trace of it. The documentation can even be considered another artwork or a complementary artwork (as in land art, for instance, or the work of Christo). I include in this group Dragan Zivadinov's *Noordung Theater*, Yuri Leiderman's *Kefir Grain* and Vadim Fishkin's *Kaplegraf 0g* - that is, all the sculptures.

3. art "about" parabolic flights, or the flight as "material" for the artwork

Here, the idea is to build upon the experience of the flight and its environment, not only on the zero-g; to work with the alternation of 0-g/2-g; with the 2-g part of it; with the noise and sound; and to work with and about the team of instructors (their knowledge, role, task, etc.), instead of trying to avoid having them in the final images, etc.

To my knowledge, only two artworks have been created in this category. The first is *Sound Wave Sculpture*, by Takuro Osaka (who flew in the Japanese plane). The sculpture is designed to behave in different ways when in 0-g or in 2-g and to reflect upon, or transmit, the physical, psychological and mental perceptions that one has of those different moments and the shift between them. The second one is *Kosmos in Blue*, by Flow Motion (who took part in a previous Russian flight). In this work, the artists recorded the various sounds and noises in the plane and mixed them in a sonic composition.

Finally, this experience confirmed my intuition that techno-science art and space-art (i.e. zero-g art) have many things in common. Just to mention a few: technology enhances the body, weightlessness dissolves its limits. In both cases, the skin is no longer the limit of the Self. In microgravity, as on the Internet, the reference of the vertical is lost and new systems of orientation have to be defined.

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Having been in a zero-g environment leads me to new directions of research and to improve my understanding of many of the current issues in art. My conclusion, then, is: yes, it does change something for an art critic to have direct experience of zero-gravity.

Biography

Annick Bureaud works and lives in Paris. She is the director of Leonardo/OLATS (http://www.olats.org). As an art critic, she runs a regular column
on electronic art in the French contemporary art magazine, *Art Press*. She teaches at the Art School of Aix-en-Provence and at Ecole Centrale Paris (school of engineering). She was guest lecturer at the School of the Art Institute of Chicago (SAIC) in 1999 and at the University of Quebec in Montreal (UQAM) in 2001. In 2002, Bureaud co-edited the book *Connexions : art, réseaux, media*, published by the Ensba Press; she co-organized the International Symposium, "Artmedia VIII: From the Aesthetics of Communication to Net art," in Paris and edited the on-line proceedings, published by Leonardo/OLATS. The article "Typologie des interfaces artistiques" has been published in the collective book *Interfaces et sensorialité*, edited by Louise Poissant, Sainte-Foy, Presses de l'Université du Québec, 2003. She is the co-editor of "Spacearts - The Space and Arts Database," a joint project of Leonardo/OLATS and the Ours Foundation (HYPERLINK http://www.spacearts.info µwww.spacearts.info§).

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May the Force be with You

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In daily life, some of the forces of nature, such as gravity and the spinning of the Earth, are hardly noticed; they feel like our skin or the air that we breathe. Without them, we wouldn't be what we are. We perceive these forces as a fish perceives the water it swims in - it does not perceive the water at all on a conscious level - except during "accidents," when things can suddenly become very clear. Gravity, as a major and still rather difficult to understand force of nature, is embedded on the deepest level of how we perceive and experience the world that we are part of.

Gravity is one of the forces that is ever-present, determining the directions of all things that grow and move, shaping all immaterial things and soft materials (often in conjunction with other forces of nature). Also, as all materials, according to the laws of thermodynamics, move from one stage of being into another (between states of radiation, gas, fluid and hard material), and as everything we know in the universe is always on the move and in a stage of transition, we can understand the impact of gravity as one of the major forces in the universe and specifically of life on planet Earth.

Most cultures have reflected upon gravity, a force that is not consciously experienced in normal situations. This is because we cannot escape the conditions that gravity creates: it keeps us

on the ground. This is somehow painful, as we can see so much space above us and see objects moving in that space. Our fascination for the invisible force of gravity that binds us to the ground is somehow obvious. Gravity therefore vitalizes our imagination and generates a strong desire to control and overcome this force, a desire that translates into rituals, religious ceremonies, mythical stories, the arts and also the sciences.

This deeply imbedded desire, to free ourselves from the physical limitations caused by gravity, is a strong and imaginative power, a strong drive and motive for developing and pushing Western technological culture. It connects itself to social, political, economic and ecological issues.

We all know that our perception is misleading and that our senses and brain construct a limited understanding of reality. Art and science have been challenging our understanding of reality over and over through research and reflection. Over time we have come to better understand the dynamics and complexity of our social, cultural and scientific realities, but "the world" as we perceive it still remains to be understood as an interface, as Otto Roesler explained in his presentation for MIR in Rotterdam; it remains a construct of our brains.

Our mistrust of reality, as well as its mystification and the wish to define a universal scientific understanding of reality are parts of a quest driven by socio-political issues as well as by the metaphysical questions about life. Falling (towards the center of gravity), levitation and flying are used as strong metaphors and physical events that are embedded in our social, cultural and scientific languages and rituals. These all refer to dynamic moments where instability and uncontrollability are important factors in challenging reality (but let us not forget that those who fly always fall down, as Icarus showed us). Questioning and designing reality, whether by science or art - or in conjunction with each other - has its price and its dangers, as history shows.

It is these factors that created the grounds for MIR, the Microgravity Interdisciplinary Research project, a collaboration between several European art organizations focusing on the relation between art and science, and art and technology. The military complex of the Yuri Gagarin Cosmonaut Training Centre in Moscow, the base for the Russian Space program, served as the facility for the MIR project and the artists that collaborated in it.

Dealing with gravity on a physiological level is best done in space travel, centrifuge devices, and parabolic flights, which are part of the Russian, American and European space programs. The parabolic flights simulate variable gravity conditions on a strong physical level for 30 seconds (after which one goes into double gravity for 20 seconds). Unfortunately, these programs are hardly as accessible for artists as they are for mostly core scientific and military-run programs. MIR created the opportunity for artists to do a series of research projects within the facilities of the Yuri Gagarin Cosmonaut Training Centre (such as parabolic flights and centrifuge). The MIR project offered the opportunity to a limited group of artists to realize artistic research projects based on the center's facilities. In general, these projects focused on the aspects of the unstable behavior of the body and bodily perception in conditions of variable gravity.

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For V2_, a central issue to research within the MIR project was the effect of visual and tactile perception in virtual reality (VR) environments and the physiological effects it causes, research that has until now mainly been conducted by scientists, even though VR is a field of research for many artists. The relation between variable conditions of gravity and VR and their effect on our perception, mind and body language was a central theme for this. It focused on our sense of embodiment within mediated spaces and mixed realities. The seminar that V2_ had arranged within the MIR project (http://lab.v2.nl/projects/mir.html) positioned this issue within the broader context of research in the field of variable gravity, as mentioned in the previous paragraphs. The central question was how and what our body perceives in variable, dynamic and unstable conditions and how we can develop aesthetic principles that deal with immersive, interactive, dynamic and process-based environments. (See the text "Machine Aesthetics," available at the V2 website and written by Andreas Broeckmann in 1997; (http://archive.v2.nl).

MIR expressed the recent wish of artists and scientists to engage in dialogue, showing the growing interest for interdisciplinary and specialized practices, whether scientific, social, economic or creative, all of which tend to be inherently introverted fields. Reconnecting and repositioning the different specialized domains in society is a social and cultural necessity, as the fruitfulness of any practice in society relates to how it is embedded socially and culturally.

Biography

Alex Adriaansens studied at the Royal Academy of Art and Design in s-Hertogenbosch, the Netherlands. He is the director of the V2_Organisation, which he co-founded in 1981. He is also a member of several advisory boards for organizations, including the De Berlage Institute, a post-academic architecture research center in Rotterdam and the Transmediale in Berlin. He is on the advisory committee of the Dutch Foundation for Visual Arts, Architecture and Design. He has given presentations at many festivals and art institutes and written texts for different publications.

V2 network relations

V2_ is a member of the EncArt network for defining a virtual European Medialab between the ZKM in Karlsruhe, Ars Electronica Centre in Linz and C3 in Budapest. This network focuses on the exchange of knowledge and experience between the four medialabs in Europe and to set up European projects for research and presentation. V2_ also participates in the Production House Rotterdam, a network that includes the International Film Festival Rotterdam, the Rotterdamse Schouwburg and the Museum Boijmans van Beuningen and closely collaborates in interdisciplinary media projects. The organization participates in the "Virtual Platform," a national platform for media-art organizations in the Netherlands that focuses on advising national policymakers and collaborations between the different participants of this platform and is involved in different projects with technical universities.

TRANSPERMIA - DÉDALO PROJECT

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My performances and installations over the last decade have been based mostly on scientific and technological issues, such as body interfaces, computational systems and new representational instruments. My research to date on these subjects has led to the creation of "dresskeletons" (exo-skeletal body interfaces), the design and construction of robotic prototypes such as the "Fleshbot," in *Joan L'home de carn* (a robot made up of mechanisms and flesh) or the "bodybots" (body-controlled exo-skeletal robots) Epizoo and Réquiem, and to the development of software models for editing and controlling interactive robots, images and sound in real time. All of these led to my definition of an interactive narrative system, Sistematurgia, which I used in my mechanotronic performances *Epizoo*, *Afasia* and *Pol*. However, and in spite of the complex technology involved in my Sistematurgies, the ideas they develop intend, not without irony, to be deeply human. In my works, I explore subjects such as the vulnerability of the body, orgiastic impulses or chimeric identities.

I have been working on *Proyecto Dédalo* since the beginning of 2003. This project consists of performing, filming and post-producing micro-performances in zero gravity. This level of gravity was reached in the parabolic flights we made in April 2003 in the Russian Star City in an Ilyushin, an aircraft designed for this purpose by the GCTC (Yuri Gagarin Cosmonaut Training Centre). A specific number of parabolas are effected during each parabolic flight: in our case, six in the first flight and 19 in the second, that is, 25 parabolas in all. A parabola is achieved by the plane ascending at 45° from a flight altitude of approximately 6,000 m. to about 8,000 m., then dropping, at the same angle, to the initial altitude. The manoeuvre submits the occupants of the plane to an atmosphere of double gravity for half a minute, then to zero gravity, or microgravity, for about 25 seconds, returning to another half minute of double gravity.

The *Dedalo* micro-performances were carried out during the brief periods of microgravity, and were organized in two blocks. In six of the parabolas, the bodybot Réquiem, a simulator of body gestures, was used, and in the remaining 19, the dresskeleton's features enabled interaction with a visual projection and a "softbot," both specifically created for this purpose.

Réquiem was initially designed and produced in 1999 as an interactive installation for my exhibition *Epifanía*. Réquiem represents a mechanical sarcophagus capable of moving (metaphorically giving life to) my body, thus its name. But Réquiem is also a gestural simulator, a robotic suit capable of carrying out sophisticated choreographies. In its installation format, Réquiem is hung from a metal support, without my body inside, and performs sequences of movements activated by the spectators by means of touch-display sensors set up in the room. For the airborne performances, Réquiem was hung by straps from the inside structure of the Ilyushin. When the parabola reached zero gravity, a technician activated a sequence and Réquiem, with me inside it, floated in a certain way. As in the

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installation, the movement of the pneumatic valves was previously programmed in a PLC computer, which ran short movement sequences adapted to the duration of the parabolas. One of Réquiem's enactments would make it possible to remember, during long periods in microgravity, how we move in earth gravity. In another sequence, Réquiem becomes a paradox of control: in surroundings where the body can float gracefully, the machine grips, controls and hinders whoever wears it. After observing the result of the parabolas during which I wore Réquiem, and taking into account the behavior of the instructors - who would not allow the machine to float about freely - this idea seems the most obvious one.

The remaining micro-performances involved the buoyancy of the body, the possibilities of the body interface dresskeleton, and the behavior of the softbot device. This soft robot consists of a rectangular aluminum body containing electrovalves, connected to four flexible plastic tube arms for compressed air, and ending in a horn and three balloons that can be blown up. The softbot is cable-connected to a mechanotronic system and controlled by modem radio from the dresskeleton. The switches attached to my index and middle fingers open and close the air flow, thus blowing up the balloons and sounding the horn. The softbot, just a bunch of cables, takes on its wider and dynamic shape in microgravity, like seaweed does in the sea.

But in addition to the softbot, I used the dresskeleton to interact simultaneously on films. Three interactive films were prepared with different graphic contents based on three subjects: microbiology, transgenics and bio-robots. Here, interaction did not involve deliberate control, as in the case of the softbot. Our lack of experience in microgravity made us consider the possibility of arbitrary movement and, therefore, of involuntary interaction. The oscillation of the range sensors produced by the movements of elbows, shoulder blades and knees activated the films via those same parts on the dresskeleton. During the first flight, I carried out this set of micro-performances simply floating in front of the screen with the occasional help of the technical team accompanying me on the flight.

But very early on, we realized that the absence of weight, and therefore of anchorage to the ground, caused variations in the synchronicity between body movements and locomotion. The extremities floated around without affecting displacements of the body. In this new dimension, the body floated freely; the body-movement vectors multiply. Metaphorically, in terms of computer programming language, the body's extremities act as an application, with its own variables, contained within another application, the floating body, that obeys its independent parameters.

As well as the feeling of strangeness caused by this new way of moving, a loss of "selfception" occurred. Selfception is our sense of movement, responsible for informing us how and when we move. When there is movement, this is the sense in charge of informing the brain of its variations. When selfception is absent, the experience of movement is blocked, and is only partly completed when you view what happened in the videographic representation.

After experiencing the first flight and viewing its result on video, we decided to change strategy and to request the help of Boris, one of the GCTC instructors. The control Boris had over

my floating body in the second flight produced an extraordinary choreography, during which I interacted with the softbot and with the films through my extremities. During this flight, the experience acquired new dimensions. Microgravity was now more familiar to us, thanks to which the result was generally more precise.

As I mentioned before, the overall experience of each micro-performance required the viewing of its videographic recording to be complete. In this sense, reality and representation complement each other to make up the final experience. Without viewing the videographic representation, the experience is incomplete. From this point of view, the films projected onto the screen ended up acquiring an unexpected dimension. The sum of the virtual images of the films and my body choreography transmuted on video into a single reality. Like the back projections in road scenes in 1950s movies, the virtual projection plus the real action make up a new reality, one represented by the videographic recording. And if this representation is the part that completes the final experience of microgravity, then virtuality is likewise part of the same.

After this experience I realized that the conquest of space is one of the most extensive and complex challenges of our time. The exosphere is agravic, anaerobic and radioactive, that is, extremophilous for man. And to inhabit it, an entirely new world must be redesigned. My guess is that, in this new orb, a myriad of new scenarios will converge. Not only will the military and scientific communities have a say in the matter - organic life, human relations, all kinds of new activities and artists, will all be fundamental. But art will reflect a world that will draw together the antagonistic concepts of biological evolution and cultural evolution, the union of what is natural and what is artificial.

We know that life exists on our planet, that it has done so for at least 3.5 billion years. One theory on the origin of life propounds that the Earth was sown with spores that arrived, carried by comets, from another part of the universe. This theory is called “panspermia.” In this theory, those simple organisms, probably bacteria, evolved until producing the endless number of organisms we know today. You could say that the strategy of life has taken 3.5 billion years to produce a sort of complex organism known as Homo sapiens, primates capable of using a form of intelligence that enables, among other things, the development of science and technology.

Inverse panspermia, or “transpermia,” as I call it, is the hypothesis leading to Utopia. Surely we all, artists included, dream of a new universe, a land waiting to be ploughed, where everything is possible. A dream that contemplates the making of new cosmogonies, of extraordinary mythologies, of unsuspected ceremonies.

Proyecto Dedalo was the conceptual generator of transpermia. And maybe it is here that my investigations come most coherently together. I have a feeling that this new and fertile field will be the origin of many new prototypes.

BIOGRAPHY

Marcel.lí Antúnez Roca is well-known in the international art scene for his mechanotronic performances and robotic

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installations. A founding member of La Fura dels Baus, he worked in this company as art coordinator, musician and performer from 1979 to 1989. In the 1990s, his avant-garde mechanotronic performances combined such elements as "bodybots" (body-controlled robots), "systematurgy" (interactive narration with computers) and "dresskeleton" (the exoskeleton body interface). The themes explored in his work have included the use of biological materials in robotics, as in *JoAn l'home de carn* (1992); telematic control, by a spectator, of an alien body in the performance *EPIZOO* (1994); the expansion of body movements with dresskeletons (exoskeletical body interfaces) used in the performances *Afasia* (1998) and *POL* (2002); involuntary choreography with the bodybot *Requiem* (1999); and microbiological transformations in the installations *Rinodigestio* (1987) and *Agar* (1999). He is currently working on the spatial artwork *Dedalus*.

OPEN SKY AND MICROGRAVITY

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Going to Star City is a great opportunity, for the parabolic flights and the Gagarin Training Center themselves, but also for the social impact, as artists, of going to this historical place of the Cold War. Going there was part of the experience, and took on a different meaning for me than going to Bordeaux with ESA, for example. It is important for us to situate these experiences within a larger social and cultural frame. This is the very purpose of the Association of Autonomous Astronauts, a worldwide network dedicated to the development of independent space programs. The AAA involves artists, activists, scientists, cultural workers, writers, sociologists, groups and individuals in Italy, the U.K., France, the Netherlands, Slovenia, Sweden, Austria, the U.S.A., Canada, New Zealand, Argentina, etc. The network is extremely concerned with developing what it calls "astrocritique."

Space programs are governed by state and military imperatives, shaped according to strictly defined logics of economic growth and international confrontation. However, the evolution of each national society, and the wider evolution towards a world society, has raised questions about the viability of these older forms of techno-scientific logic, and has thereby opened windows to other possibilities. The MIR program is one such window. It is urgent to communicate these alternative views in such a way as to avoid cultural confinement, to make it clear that the artistic gesture is fundamentally a way of inviting wider reflection and exchange on the course that human development is taking. Thus, astrocritique aims to put a new kind of discursive platform into orbit: one where evaluation bears not on the contours of autonomous forms, but instead on the autonomy of human beings themselves, today, within society; on our capacity to think, feel, imagine and communicate beyond the normalized, gravity-bound precedents set by preceding institutional structures and coercive economic pressures.

My mission in the short moments of microgravity during the MIR flight, as a representative of the AAA, was to hold placards with AAA slogans, such as "See you in space," and "Stop Star

Wars." The MIR campaign took place during the period of the war in Iraq and I believe that a "Stop Star Wars" demonstration in microgravity can be more effective than any demonstration against the militarization of space and U.S. weapons programs. The "See you in space" picture is to be used as the front cover of the AAA book in English, to be published before the end of the year. The intention is to show that space access must be opened up to civilian society. This propaganda mission was fully accomplished.

Astrocritique is just another name for the recent, largely successful efforts to come to grips with what the most interesting art of our time is really attempting: namely, the evaluation, by multiple and conflictive criteria, of the technological and organizational changes that are transforming the face of the globe and the character of the various human societies; and above all, the redirection and alternative usage of those technological and organizational changes. The MIR project is one more opportunity to bring a new type of criticism to bear, and to use exceptional artistic experiments as a springboard to ask the overarching question: What can the productive capacities of the "general intellect" do to make life better, rather than increasingly worse?

As part of the project, we looked at the ways our own projections and fantasies might alter our objectivity, and how we could develop an artistic and literary perspective on the "dream of flight." Knowing full well that this first experience would have uncontrollable effects on our bodies, we proposed to friends (a sociologist, a pharmacologist, an art critic and myself) during the application process to carry out a serious study of "space motion sickness," with research into its pharmacological treatment. Unfortunately, this project was probably too difficult to realize in the context of MIR and Star City. But as an artist, journalist and tactical media researcher, I was selected as a participant to undertake personal research.

My actual research is concerned with conversion processes of former Cold War technologies into civilian and artistic uses. I have been working, with the help of Projekt Atol in Slovenia, on different projects, including the self-sustaining laboratory Makrolab (see http://makrolab.ljudmila.org) and the article "Projekt Atol
Flight Operations and the MIR Network," by Marko Peljhan, in this issue) and research by the Acoustic.Space.Lab network (http://acoustic.space.re-lab.net)
on the RT32 antenna. The
RT32 is a former U.S.S.R. 32m radio telescope situated in the forests of western Latvia in Irbene, at the site of the Soviet-era Space Communication Center Zvyozdochka ("The Little Star"). Formerly used by the KGB to spy on satellite transmissions between Europe and North America, the antenna was abandoned and nearly destroyed when the Russian Army departed in 1994. The dish was successfully repaired by VIRAC (Ventspils International Radio Astronomy Center) radio astronomers and converted for fundamental science, radioastronomy, radio-amateurs and sound artist research.

The access to Star City for artistic researches with no imperative results for space agencies is also part of this historical moment. In the post-Cold War/Desert Storm era of "Information Dominance," these initiatives appear to bring examples of peaceful uses of space technologies and give a

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chance for space artists to investigate further the "world we have to leave behind." My art project investigating these issues is to be presented in Paris in October 2003, during the Festival "@rt Outsiders: Space and the Arts" (http://www.art-outsiders.com) at the Maison
Européenne de la Photographie, in a room called "Open Sky."

BIOGRAPHY

Ewen Chardronnet is a video artist, musician, journalist and researcher in observation systems and tactical media. He was the editor of the anthology "Quitter la gravité" for the Autonomous Astronauts Association (de l'Eclat, 2001) and works with the World-Information.Org; with Projekt Atol on the Makrolab project (a self-sustaining laboratory operating in telecommunications areas, migrations and weather systems); for Tangente University (Strasbourg, France); and with Ellipse (Tours, Fr.). As a musician, he currently performs with Kodwo Eshun (U.K.) with the zero-g performance, *Aerodrom*. He recently put together the art project Electronic Media Monitoring (2002-2003) in collaboration with Slovenian artists Marko Peljhan and Tomaz Sustar, presented at the World-Information framework in Amsterdam and Belgrade, at the Generali Foundation in Vienna and at the New Museum in New York.

INITIAL REPORT ON THE PILOT STUDY ON THE MILITARY AND BEHAVIORAL PRECONDITIONS FOR PERMANENT HABITATION IN MICROGRAVITY

by the Otolith Group:

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In the present era of the "preemptive strike," the likelihood of nuclear detonation is more intense than ever before. The search for habitable environments has become a necessity rather than a diversion. This imperative led the Otolith Group to investigate the minimum preconditions for permanent habitation in microgravity. This report presents the initial research into the environmental and behavioral conditions for agravic (non-gravitational) habitation.

Star City, home to the Russian space program, is located at Zvezdnyy Gorodok, 40 kilometers northeast of Moscow. Built in the 1960s, it contains the Yuri Gagarin Cosmonaut Training Centre (GCTC) and a residential area to house space personnel. Today, it is common knowledge that Star City was a state secret until the mid 1990s and it remains all too easy to fantasize that Zvezdnyy Gorodok was constructed to screen Star City from civilian eyes.

On the flat winter night of 7 April 2003, the Otolith Group

entered the Star City main gate after an hour's delay. Once inside, the second hour of delay impressed upon us the extent to which we were entering militarized, defensible space. From the outset, it was clear that Star City provided the spatial, territorial, consensus-forming and rule-governing context for microgravity.

As a delegation from the MIR Consortium, the Group's status was that of international researchers, with access denied to ordinary tourists - in practice, the military context overruled all such privileges. It became clear to us that the military personnel inadvertently became co-producers and facilitators of our pilot study. Did we absorb them into our research or did they absorb us into their protocol? Were we demilitarizing them or were they remilitarizing us?

These were questions that preoccupied us as we passed through the precincts of Star City on our journey toward microgravity. Due to its mix of 1950s bunker architecture, 1960s tower-block estate, 1970s tourist museum and post-War interior-décor, being steered around Star City soon induced a distinctive sense of cultural disorientation. One experienced the peculiar sense of stepping into and out of a series of long-forgotten film sets.

The Yuri Gagarin Cosmonaut Training Centre itself consisted of the Virtual Space Academy and the Scientific Research Complex that housed the simulators designed to train cosmonauts for space flight. These simulators generated and contained the colossal forces necessary for orbit, resulting in a brutalist architecture of monumental mass. Unlike Hollywood, simulation here functions to rehearse the dangerous reality of space.

Direct behavioral contact with microgravity lay within the Ilyushin 76 airplane, stationed at the military airfield some 15 minutes outside of Star City. In preparing its experiments for microgravity, the Otolith Group gave considerable attention to the processes of apparent spatial reduction, temporal distortion, weight loss and disorientation, all of which converge to make normal life abnormally complex.

Given these conditions, the Group designed anti-spectacular actions that took the form of simple, bare actions. Through a process of reduction, the Group arrived at five actions to be repeated throughout the 25 parabolic flights. These were as follows: combing hair while holding a mirror; applying lipstick; swallowing a vitamin pill; reading a book; writing a letter. The space itself suggested a sixth action: sleeping.

In transposing habitual Earth-bound actions to a non-habitual space, the Group were able to test the minimal requirements for normal habitation in microgravity. In the context of intensive time, where the constants and constraints of one G-load have either reversed or disappeared, these actions were designed to establish the psychosocial norms for life.

The actions were successful on three counts. Firstly, they were so normative that the commander of the Ilyushin 76 himself failed to grasp that an experiment was actually taking place. Secondly, this failure indicated the temporary demilitarization of agravic space. The behavior created what Georges Perec called "a new species of space," in which the masculine norms of the airplane cabin were infiltrated by an informal, intimate, partially feminized affective dimension. Thirdly, the actions created a zone of privatized concentration that felt out of

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place and out of time.

This sense of focus partially explains why the experience of short-term microgravity was not powerless but powerful. The most vivid sensation was of having gained a new superpower, of an extension of power over a previously unattainable dimension of space.

The actions indicated that the process of agravic reorientation clarified the awful reality of the contemporary moment. With nowhere to hide, the Group experienced geopolitical disorientation as near-nauseating euphoria.

Biographies
Kodwo Eshun

Kodwo Eshun is a cultural critic, author of *More Brilliant Than the Sun: Adventures in Sonic Fiction (Quartet)* and curator based in London. In 1999, he co-curated "Dub Housing," the exhibition, symposium and concert for Steirische Herbst in Graz, Austria and attended Ars Electronica as Judge for the Digital Music Jury in 1999 and 2000. He is a member of the Board of Directors for Artangel and an Assessor for the Arts Council Arts and Science Research Fellowship in 2003. Eshun is co-curator of the first Retrospective on the work of the Black Audio Film Collective.

Anjalika Sagar
Anjalika Sagar is a sound artist and curator based in London. As a composer and artist, Sagar has collaborated with Talvin Singh and Jem Finer and is resident at Berlin's Humboldt University Kittler Group/Bootlab in 2003. An Arts Council Fellow of 2001, Sagar is co-curator of the first Retrospective on the work of the Black Audio Film Collective, supported by the International Institute of Visual Arts.

Richard Couzins
Richard Couzins is a video and mixed-media artist based in London whose work focuses on the relation between language, moving image and audio. Couzins has exhibited solo and in group shows throughout the U.K. and Europe. Recent projects include *Actual Size*, at Overgaden, Copenhagen and New Video Work at Hoxton Distillery, London.

Filming in Micro-gravity

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In 1916, Hugo Munsterburg wrote in regard to theater that "whatever it shows is controlled by the same laws of causality which govern nature," whereas film, he thought, was free of such laws. I am reminded of this when I think of filming in microgravity. The moment new laws are introduced is a fecund hiatus. When I thought about microgravity, it was the transitions between gravitational forces and the visual effects this could produce that excited me.

During the flights, when the apparent gravitational field changed, we rose up and when it stopped, we fell down. The difference between the experience and the record is emphasized

because the experience is new and indefinable. But the subsequent definition is the forging of new language. It augured a micro mega-evolutionary jump, a brief chance to experience an environment alien to our bodies. Recording an event usually allows one to return to the memory, but here it is as if layers of effects have obscured the original. Looking at the video of the flight is like consulting notes - it reminds you of the experience but emphasizes the limits of representation.

The forces acting upon our bodies are low in our perceptual hierarchy. Just as a solar eclipse realizes the horror of the benevolent Sun disappearing, microgravity gives a magical inkling of forces before acclimatization. The experience of microgravity caused a perceptual jolt. A cosmonaut trainers' body moved over my head. He was avoiding our work by flying over our heads. I am tempted to say like a type of animal that runs across ceilings, except this was a human. What type of animal would we become? I accidentally found myself in a cubic meter of space with three other people, our heads came together, and the space was activated, where on Earth it would be a dead zone. Is this a banishment of negative space as such zones are redefined?

During the first parabola, something came in front of the lens of my camera. It was my legs. I didn't recognize my own body. Perhaps the disorientation that causes you to disconnect and then relearn your body enables you to see afresh what is otherwise taken for granted. Ordinarily, to observe my body thus would mean having to think like a dancer or choreographer. We sometimes drive over hump-back bridges or accelerate in elevators but it creates a fleeting nudge rather than the major awe of radically altering our bodies' environment.

In microgravity, our bodies were architectonic, describing the space they inhabited. Microgravity is a hotbed for new cultural development. Language evolves from our body situated in 1-g. Filming in a lying position but with no ground beneath me begged the question, How integral is the floor to lying down? Newton's laws change human language - lying down is standing up.

Microgravity allowed me to inhabit spaces I normally only look into. The change from 1 to 0-g does not affect the camera's framing but I had a greater sense that the tape was running. My perceptions were heightened because objects had a changed potential for movement. I was more aware of my body - where was it in space? On Earth, one doesn't concentrate on where the body is, but with the environment radically changed, one does. Filming becomes a more holistic process. Movement had a kind of reciprocal relationship with that on Earth, like a strange control experiment against our habitual gravitational field. The camera can float in space, its movement controlled like the rudder of a ship and nearer to the all-seeing kino-eye. All these different possibilities and what about friction coefficients!

The reality of three-dimensional movement is something that has to be learned. I was going through the sense of awe. Our perceptual relationship with our environment on Earth is vexed, so the microgravity environment gave more scope for thought than conclusions. I took from the experience knowledge of standing back from this world. The phenomena of dreams and digital effects really happened, so weightlessness was like having certain conceptions thrown up into the air with you.

(For author's biography, see previous article)

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Kaplegraf 0g (drops orbits)

Vadim Fishkin (written with Livia Páldi)
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I still remember what a long-lasting impression a black-and and-white telecast from a Soviet space station made on me as a child. I especially recall the moment when a cosmonaut poured out water from a glass - the suspense and transformation of the water into amorphous shapes and different oblong drops captured my attention so much that I forgot about the people levitating around it.

Then, many years later, it all came back to me with a Stanislaw Lem novel. The story, I recall, was about extraterrestrials from Venus who described our material civilization with amazing accuracy but failed to recognize people as individuals and creators. Instead, they talked about particles of some strange, homogeneous, soft mass which had continuously been separating into shapes of oblong drops. It remained for them a puzzling substance - a form retaining information - that they couldn't decipher in connection to the environment.

My decision to use water in my work is very much linked to some recent scientific research that has proved water to be a keeper and compiler of information - the nearly ready biocomputer. The first basic and surprising fact was the detection of large, stable vectorially symmetrical formations of 57 molecules of water, representing dodecahedral tetraheders that are constructed according to the equiprobabilism principle of the linkage of molecules of the water. The question of decoding telepathy, telecines and other unusual phenomena with the proof of possible interaction between water's information system, water and vacuum has already been acknowledged as a topic and problem of science.

The Kaplegrafs are devices that can translate data into the language of "water drops" and use water to convey meanings that transcend normal linguistic conventions. The name "Kaplegraf" is a contraction of the word meaning "drop" in Russian and "-graph" - an element borrowed from Greek, meaning "drawn" or "written" and which indicates, in a more specialized sense, the instrument rather than the written product of the instrument. In the Valencia installation, *Kaplegraf (techet reka Volga)*, 30 "drop devices" followed a cult song about the Volga river. With *Kaplegraf (Drops of Reason)*, the visitor was invited to make the device "communicate" via a personal computer. The device learns to solve given mathematical operations (using addition) and tells the result in its computer-generated voice, followed by the required number of drops falling into transparent bowls. The amplified sound of the drops dominates the exhibition space, from time to time arousing tension between the "romantic" atmosphere of the shower of water drops and the programmed character of the spectacle triggered by visitors.

While in normal gravity conditions, the Kaplegraf translates a time-based substance (sound/voice) into a more corporeal, but still ephemeral , substance (drops of water), while in a zero-gravity situation, the drops remain in space, allowing for their more visible and material appearance. *Kaplegraf (Drops Orbits)*

was built with a specially made plastic ball, containers with constant pressure and special valves, a notebook PC and a video camera (attached to the ball). The colored drops were programmed to "visualize" sequences of Johann Strauss' *Blue Danube* while floating in elliptical paths.

Biography
Vadim Fishkin was born in Penza, in the U.S.S.R., in 1965. He studied at the Moscow Institute of Architecture, graduating in 1986. He lives and works in Ljubljana (Slovenia) and Moscow. He has done solo exhibitions at the Museum of Modern Art, Zagreb; the Isabella Stewart Gardner Museum, Boston; and the Biennale di Venezia (1995). His group exhibitions include "Imaging Prometheus," at the Pallozzo della Ragione, Milan (2003); "Station Utopia," at the Biennale di Venezia, Venice (2003); "Collection 2000 +" and "Iconoclash," at ZKM (2002); "Projet Utopie, Construction," at Jeu de Paume, Paris (2000); "After the Wall," at the Moderna Museet, Stockholm (1999); and "Europaer," at the Grazer Stadtmuseum, Graz, Steirischer Herbst (1993). He has done stage design for various dance performances, including the *Cabinet Noordong* in Ljubljana, Slovenia.

The Celestial Vault

Stefan Gec
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Before outlining my project, I would like to briefly place it within the context of previous works, projects and practice.

A substantial element of my work stems from my father's experience as a refugee from the Ukraine following the Second World War. My engagement with this history, which also encompasses the Cold War, has led to work that has used scrapped metal from de-commissioned Soviet submarines, casting them into bells, large-scale photographs of firemen who died at Chernobyl, the construction of a fully operational ocean-going buoy, through to a scale model and computer animation of a Trident nuclear submarine. These projects have tapped into notions of movement, dislocation and history that stem from my own family background. The works' extended references go beyond my own inquiry, enabling me to reach, I hope, a wider audience.

My participation in this project centered on the centrifuge housed in a monumental, but simple, circular hall. I was drawn to using this equipment in order to make a work that would engage with the colossal machine and its function to simulate the significant g-loads a cosmonaut would experience in space flight. In particular, I was keen to make a work that would be physically marked or affected through the experience. As a result of these ideas, I proposed to make a hollow celestial globe (30 cm in diameter). This specially made copper globe was painted and transcribed with the star constellations of the northern and southern hemispheres upon its surface. My objective was to install the globe in the cockpit of the centrifuge, then slowly expose it to the mounting g-load until it became distorted.

During my first meeting at the centrifuge, its operators and technicians made it clear that simply securing the sphere in the space normally occupied by the cosmonaut would not alone distort

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the globe. Through these discussions, it became obvious that some form of intervention was going to be necessary. The technicians' simple solution entailed drilling two holes through the globe's poles, allowing a steel rod to pass through it. This rod was then secured at one end by a round steel plate and a bolt and a weight was attached to the other end of the rod, several inches below the globe. Through this process, auxiliary weight would be exerted onto the sphere's body via the weight when exposed to g-load.

The work was installed into the centrifuge for the first of two trials, each to go from 0-g to 10-g. Over the next hour, I was able to watch the globe from the control room, via a camera mounted in the cockpit of the centrifuge. Following its term in the centrifuge, the globe was retrieved. It had been crushed at its poles, its exposure to the centrifuge indelibly marked.

At its simplest, this work offers a description of the g-load that was transferred to the globe. The work also ties into long-running themes around my work, which I briefly outlined earlier, primarily through Star City's significant role in the former Soviet Union space program. This program was in part fuelled by its rivalry with the U.S.A. and quickly established itself as another strand of the Cold War, as East and West fought for supremacy in space.

However, on a deeper level it is a response to a different type of time and movement where something or someone is projected into a physical state beyond their usual experiences. The altered globe, following its exposure to the equipment, became a physical manifestation of our ancient desire to reach out to the stars. Finally, the work undertaken on the sphere by the centrifuge technicians added an element not foreseen in my preparatory work or original plan: their input, I feel, ultimately made a richer work through their contact with the globe.

Biography
Stefan Gec was born in 1958 and currently lives and works in Yorkshire, England. He graduated from Slade School of Art, London. Since 1989, he has been engaged in the production of a number of site-specific and process-based artworks, which are rooted in his Ukrainian father's experience as a World War II refugee. He has exhibited widely, showing at The Museum of Contemporary Art in Helsinki, Finland; the ICA in London and Art Metropole in Toronto, Canada.

LEONARDO REVIEWS 2003.09

Leonardo Reviews is pleased to announce the new postings for September 2003 at:
http://mitpress.mit.edu/e-journals/Leonardo/ldr.html

The Leonardo Reviews panel has clearly had a productive month, submitting 22 reviews. In addition to established regulars such

as Mike Mosher, Roy Behrens, Stefaan van Ryssen, Amy Ione, Robert Pepperell and Dene Gregar, we are especially pleased this month to publish reviews by newer panel members Pia Tikka, Rob Harle, Dennis Dollens and Richard Kade. The particular ecology of *Leonardo Reviews* clearly benefits from the summer conference season and, one suspects, the academic cycle. This month, we feature an abbreviated version of Pia Tikka's review of the fifth *Consciousness Reframed* conference (the complete version, including details of many of the papers, is on the *Leonardo Reviews* website) together with Dene Gregar's response to Marille Hahne's book on artist Jill Scott. As always, we are indebted to Stefaan van Ryssen for his insights and particularly for this month's entreaty to have some fun and reach for our French dictionaries as he reviews *Cognition et création, Explorations cognitives des processus de conception.*

Finally, to state the obvious, as the extent of *Leonardo Reviews* increases, so the demands on the production team also become greater. Thanks are especially due for the energies of Bryony Dalefield, our managing editor, and Robert Pepperell, the web coordinator and one of our more prolific reviewers.

Michael Punt
Editor-in-Chief
Leonardo Reviews

Leonardo Reviews - September 2003

Against the Modern: Dagnan-Bouveret and the Transformation of the Academic Tradition, by Gabriel P. Weisberg
Reviewed by Michael R. (Mike) Mosher

Anglo Modern: Painting and Modernity in Britain and the United States, by Janet Wolff
Reviewed by Michael R. (Mike) Mosher

The Audible Past: Cultural Origins of Sound Reproduction, by Jonathan Sterne
Reviewed by Michael Punt

BEAP 02 | The Exhibitions Biennale of Electronic Arts Perth, at the John Curtin Gallery
Reviewed by Michael R. (Mike) Mosher

Coded Characters: Media Art by Jill Scott, edited by Marille Hahne, editor
Reviewed by Dene Grigar

Cognition et création, Explorations cognitives des processus de conception, edited by Mario Borillo and Jean-Pierre Goulette
Reviewed by Stefaan Van Ryssen

Consciousness Reframed 2003: Art and Consciousness in the Post-biological Era - The Fifth CAiiA International Research Conference
Reviewed by Pia Tikka

Eisenstein: The Master's House, a film by Naum Klejman, Marianna Kireyewa and Alexander Iskin
Reviewed by Roy R. Behrens

Exodesic: Structures, Tumbleweeds, Electronics, by Dennis L.

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Dollens
Reviewed by Rob Harle

Film and Authorship, edited and with an introduction by Virginia Wright Wexman and The Visual Turn: Classical Film Theory and Art History, edited and with an introduction by Angela Dalle Vacche
Reviewed by Michael R. (Mike) Mosher

Frankenstein: Penetrating the Secrets of Nature, by Susan E. Lederer
Reviewed by Robert Pepperell

Hop on Pop, The Politics and Pleasures of Popular Culture, by Henry Jenkins, edited by Tara McPherson and Jane Shattuc
Reviewed by Stefaan Van Ryssen

Index Architecture, edited by Bernard Tschumi and Matthew Berman
Reviewed by Dennis Dollens

Isamu Noguchi and Modern Japanese Ceramics: A Close Embrace of the Earth, by Louise Allison Cort and Bert Winther-Tamaki
Reviewed by Rob Harle

Making Space: The Development of Spatial Representation and Reasoning, by Nora S. Newcombe and Janellen Huttenlocher
Reviewed by Amy Ione

Multiculturalism, Postcoloniality, and Transnational Media, edited and introduced by Ella Shohat and Robert Stam
Reviewed by Michael R. (Mike) Mosher

Painted Landscapes of the Times: The Art of Sue Coe, a film by Helene Klodawsky
Reviewed by Roy R. Behrens

Picturing Extraterrestrials: Alien Images in Modern Culture, by John F. Moffitt
Reviewed by Dene Grigar

Snap to Grid: A User's Guide to Digital Arts, Media and Cultures, by Peter Lunenfeld
Reviewed by Michael R. (Mike) Mosher

The Virtual Score: Representation, Retrieval, Restoration; Computing in Musicology 12, edited by Walter B. Hewlett and Eleanor Selfridge-Field
Reviewed by Richard Kade

Writing and Developing your College Textbook, by Mary Ellen Lepionka
Reviewed by Michael R. (Mike) Mosher

Zygosis, a film by Gavin Hodge and Tim Morrison
Reviewed by Roy R. Behrens

Consciousness Reframed 2003: Art and Consciousness in the Post-biological Era

The Fifth CAiiA International Research Conference, UWCN, Caerleon Campus, Wales, U.K. 3-5 July, 2003. Convened by Roy Ascott.

Reviewed by Pia Tikka, Elomedia research school, University of Art and Design, Hämeentie 135 C, 00560 Helsinki, Finland
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The Consciousness Reframed conference returned this year to Caerleon, where it was first convened in 1997 as the multidisciplinary arena for issues of art, technology and consciousness. Combining both theory and practice, it offered an extremely broad range of presentations. The issues varied from purely philosophical approaches to consciousness, allowing a glance at the hot-spot dialogue between virtual reality and our everyday reality, to practice-based analysis and the exploration of embodied mind and its possible applications in negotiating the boundaries between arts and sciences. Many perspectives seemed to involve the post-biological condition of art, put to practical use in the symbiosis of technology and consciousness, or, the technoetic as defined by Roy Ascott [1]. Many apparent differences between various approaches on the conceptual level may only be matter of perspective. As Eril Baily put it to me at the Newport train station, "We all know what we are talking about, but we do not know what it is."

When attending the presentations, it seemed to me that philosophers, on one hand, and artists on the other, understand and discuss consciousness very differently. This is why, as a preface to this review, I would like to briefly sketch my vision of convergence between conventionally distinct disciplines like, for instance, cognitive materialism, represented by Daniel Dennett [2] and conceptual idealism [3] adopted, for example, in Roy Ascott's theories of telematic art. Transgressing the preset conceptual borders of these distinct domains enables us to scrutinize their structure from outside. This method of stepping outside is traditionally used by artists when trying to view phenomena from unconventional perspectives, such as upside-down or as a collage of conflicting perspectives. The inside and outside are seen as interdependent entities, evolving in a continuous interaction and transformation. This interaction is emergent and productive as such, but viewed in the scientific context, it needs to be, if not explained, somehow conceptualized, or described.

Neuroscientists and consciousness researchers may or may not accept a view of the global neuronal workspace model as a conceptual metaphor for consciousness, but in this review I consider it as a plausible one. The workspace model, according to Dennett [4], suggests a non-hierarchical, collateral, co-operative, even competitive, modular system, which allows a multidimensional global accessibility. I maintain that the metaphor of consciousness as a global workspace attributed above characterizes perfectly well the assertion of phenomena both on the neuro-biological and techno-social levels of observation. This is why I am tempted to suggest a broadscale conceptual isomorphism ranging in-between the microscale structure of consciousness to the macroscale structure of the planetary consciousness. I put forward this idea because I am convinced that the fundamental structure of human conceptual systems is relatively independent of the differences in languages and cultural inheritance, but intrinsically dependent on the embodied orientation to the environment. I also assume that the way we speak about very different issues is based on the repetition and recycling of the same, presumably limited and slowly changing embodied inference structures, such as the body-

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based orientational metaphors of George Lakoff and Mark Johnson [5]. This allows us to conclude that at least artists and other visionaries can freely use the method of intrusion, transgression and analogizing when exploring the conceptual resources of other disciplines. For an artist, the tools of broadscale conceptual isomorphism and the metaphor of multi-dimensional global workspace enable access to the infinite domain of conceptual evolution - from private/neuro-biological to public/cultural dimensions of consciousness. Through my understanding, this "no-one's land" is where the micro- and macro-environments of consciousness research intertwine, and where a holistic dynamic organism-like ontology about consciousness as a subject-environment interaction emerges.

Consciousness Reframed 2003 juxtaposed many apparently different discourses of art and science, characterized by dicothomies between theory and practice, private and social, biology and technology, virtual and real. It seemed to allow interrelated, competitive, and cooperative human activities to emerge in a mutually accessible global workspace. The reason for this may be found in Ascott's words: "To artists ... it is less a matter of seeking to explain consciousness and more a matter of exploring how [consciousness] might be navigated, altered, or extended; in short, reframed" [6].

The facts of reality have forced me to leave out of this review more profound scrutiny of many interesting presentations. We look forward to the forthcoming publications of the collected texts, which will do justice to those which I am not able to include, and open the debates to a wider constituency. Consciouness Reframed 2003 fullfilled my expectations as a planetary platform, or workspace, and, upon returning to my own solitary research chamber in Finland, I knew that many enthustiatic artists and researchers were out there to reconnect.

Abstracts can be found at (http://www.caiia-star.net/production/conref-03/abstracts.html)

NOTES AND REFERENCES

[1] see R. Ascott (ed.), *Reframing Consciousness* (Exeter: Intellect Books, 1999) p. 1.

[2] see D. Dennett, *Tietoisuuden selitys* (Consciousness Explained), Finnish edition, translator Tiina Kartano (Helsinki: Art House, 1999).

[3] See the introduction to *Telematic Embrace: A Love Story? Roy Ascott's Theories of Telematic Art,* ed. E. A. Shanken: "Peter Russell, writing in 1982, built on Teilhard's notion of noosphere in his thesis on the 'global brain.' Such an idea appealed to Ascott, who in 1966-67 had theorized that 'A highly interactive CAM network on an international level might form the embryonic structure of a world brain.' [See R. Ascott, "Behaviourist Art and the Cybernetic Vision," *Cybernetica: Review of the International Association for Cybernetics*, Vol. X, No. 1, 1967, 25-56 p. 37.]." Reference at HYPERLINK http://telematic.walkerart.org/timeline/timeline_shanken.html µhttp://telematic.walkerart.org/timeline/timeline_shanken.html§

[4] D. Dennett, "Are we Explaining Consciousness Yet?," final draft [cognition.fin] for *Cognition* (27 August, 2000) HYPERLINK "http://ase.tufts.edu/cogstud/papers/cognition.fin.html" µhttp://ase.tufts.edu/cogstud/papers/cognition.fin.html§

[5] See G. Lakoff and M. Johnson, *Philosophy in the Flesh: The Embodied Mind and it's Challenge to Western Thought* (New York: Basic Books, 1999).

[6] R. Ascott (ed.), *Reframing Consciousness* (Exeter: Intellect Books, 1999) p. 2.

CODED CHARACTERS: MEDIA ART BY JILL SCOTT

edited by Marille Hahne, Hatje Cantz Verlag, Ostfildern-Ruit, Germany, 2003; 240 pp., illus., With DVD. Trade, $29.80. ISBN: 3-7757-1272-0.

Reviewed by Dene Grigar, Texas Women's University
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How can one capture on the printed page the rich and varied career of a media artist whose work is articulated in three distinct art forms, covering three distinct periods of personal output and taking place over three different continents? As overwhelming as this task may seem at the outset, it is easily - and compellingly - achieved in *Coded Characters: Media Art by Jill Scott*.

The book opens with introductions by artist-scholar Roy Ascott and Scott herself, an interview by art historian Robert Atkins and an essay by critic Anne Marsh and closes with essays by Yvonne Spielmann and Robert Atkins. Taken together, these acquaint the reader with Scott and function as teasers for what is to come: 159 pages of her work presented chronologically and divided into three sections, corresponding to the three periods of time her career covers, the three places she inhabited during that time, and the three distinct media through which she spoke. It would not be giving the book away to say that the artist makes good on the promises made earlier, for Scott's in-depth commentary that accompanies each entry and the images reproduced in both the book and the DVD satisfy the reader's desire to know her more intimately. One leaves knowing that an exploration of the body drives her work (p. 14), that her politics lean heavily toward feminism (p. 22-23) and that her goal is to explore the way in which both artist and audience are transformed through "the organic, mechanical, and virtual changes surrounding [them] and their transformed stage" (p. 8).

The first section of the book is called "Analog Figures" and covers the earliest period of her work: having migrated from Melbourne, Australia to the San Francisco area in 1975 after graduating with a degree in art, she experiments with performance art for both photo-montage and video and engages in an exploration of the organic aspect of the body. During this period, she produces the "body action" works *Taped* (1975), *Boxed* (1975), and *Tied, Strung* (1975); performance pieces that include interactivity, video, or an element of surveillance, such as *Accidents for One* (1976), *Extremities* (1977), *Out*, *The Back* (1978), *Choice* (1979), *Sand the Stimulant* (1980), *The Magnetic Tapes* (1981), and *Constriction Part One* (1982); and an early installation entitled *Constriction Part Two* (1982). As with all three sections of the book, all of Scott's works created during the period are included and highlighted by images from her

performances.

The second section, "Digital Beings," heralds Scott's shift into video and television that took place in the 1980s. At this point, she had returned to Australia, become active in the various art and political communities, and fallen under the influence of French structuralist theory. Turning, in particular, to Roland Barthes for an understanding of the "multifaceted, pluralistic rather than dualistic roles for the observer as well as the observed" (p. 97), she examines the body as it is "delayed and distorted into bits and bytes" by the mechanics of the machine (p. 96). The result is a clear transformation of her work from performance art to art installation. Works produced during this period include *Constriction Part Three* (1983), *Double Dream* (1984), *The Shock of the Still* (1985), *Double Space* (1986), *The Great Attractor* (1988), *Life Flight* (1989), *Continental Drift* (1990/1991), and *MachineDreams* (1991).

The final stage, "Mediated Nomads" of the 1990s, sees Scott moving to Northern Europe, where she lives today. Once again, her work takes a new direction - this time it expands into the virtual space of computer environments. From this period come *Paradise Tossed* (1993), an interactive computer animation; *Frontiers of Utopia* (1995) and *A Figurative History* (1996), both interactive media installations; *Interskin* (1997), an experiment in virtual reality; *Immoral Duality* (1997), interactive robot and shadow environment; and *Future Bodies* (1999) and *Beyond Hierarchy* (2000).

Readers wanting a closer look at Scott's art will be pleased to find a DVD containing videos of several of the works included with the book. Technically speaking, the DVD works with all platforms and is easy to navigate; the video clips included on it are well-selected and engaging. In brief, it adds a valuable component to the printed text.

This book chronicles a fascinating journey in the media arts. It is a must-read for anyone involved in the field, who has followed Scott's work through these three decades, or who wishes to have
a better understanding of various artforms that emerged from mass media in the late twentieth century.

COGNITION ET CRÉATION, EXPLORATIONS COGNITIVES DES PROCESSUS DE CONCEPTION (Cognition and creation, cognitivist explorations of design processes)

Edited by Mario Borillo and Jean-Pierre Goulette, Mardaga, Sprimont, Belgium, 2002. 400 pp., illus. b/w, paper, ¬ 35.00. ISBN: 2-87009-803-0.

Reviewed by Stefaan Van Ryssen, Hogeschool Gent, Jan Delvinlaan 115, 9000 Gent, Belgium
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The title of this book translates as "Cognition and Creation: Cognitivist Explorations of Design Processes." I must admit that I am in doubt as to whether it should be "design processes" or "processes of conceptual design," because of the content of this book. Most of the 15 articles or chapters deal with the first stages of architectural design, the phases between the first

formulation of the problem and the formal and final plans. There is no reason why the architect's work in this stage should not be seen as an artistic enterprise, within a more or less restrictive context, so this emphasis is exemplary for design processes at large. On the other hand, some of the later chapters of the book discuss the processes involved in the creative processes of choreographers and composers when they are still working on the conceptual level, designing larger-scale structures and selecting key transitions, materials and contents, something I would rather call conceptual design.

Either way, the authors try to model and understand the cognitive processes at work in an act of creation. This is not an easy task, and the editors are well aware of the difficulties. Part of the discussion is about what it actually means to "design" and fortunately, no one tries to give a definitive answer. It slows down the pace of the book as a whole, but it also opens the doors to a wider variety of approaches, and that is what makes this volume worthwhile.

Part 1, "Models and Processes of Design," is mostly a discussion of the field itself. Part 2, "Computation and Creation," contains some very interesting contributions on the use of computers in the design process, both as an aid in designing and as a tool for simulating the act of creation. Some of the book's most provocative essays are included in this part. Philippe Dehayes discusses the use of technology in building operational models of design (in this case again, architectural design) and Guy Théraulaz contributes a wild but brilliant essay, "How Could Social Insects Help Us to Solve Complex Problems?" which, of course, discusses issues of parallel-distributed computation, emergent behavior and auto-organization.

The third and final part offers five more chapters on the cognitive inroad to creation. Jean-Luc Soubie and Florence Buratto contribute an outstanding analysis of collective and cooperative design models and the book's editors, Mario Borillo and Jean-Pierre Goulette, explore the role of language in architectural design, formulating an outline for an ontology of a formal semantics (!) of the architectural vocabulary.

For readers with a limited command of the French language, this book may be off limits, but I would advise anyone who can spare the time and who has a good dictionary at hand to try to enjoy the hilarious and very clever essay by Jean-Pierre Chupin: "'La Mariée mise à nu...' (à propos de l'enseignabilité des modèles de la conception)" or "'The Bride Stripped Bare...' (On the Instructability of Models of Design)," which reads Marcel Duchamp's masterpiece as a blueprint for the creational process.

OLATS NEWS

LEONARDO/OLATS CO-SPONSORS SYMPOSIUM ON ZERO-GRAVITY ART

Visibility and Legibility of Space Art
Art and Zero Gravity: The Experience of Parabolic Flights
Paris, France, 4-5 Oct 2003

 ISSN 1071-4391 ISBN 978-0-9833571-0-0

http://www.olats.org

International Festival @rt Outsiders
Maison Européenne de la Photographie
5/7 rue de Fourcy
75004 Paris
Métro: Saint-Paul

This symposium is a joint project between the @rt Outsiders International Festival (http://www.art-outsiders.com) and Leonardo/OLATS (http://www.olats.org).

The symposium proposes to:

- Present the details of parabolic flights and consider the main issues, outside of their spectacular nature
- Specify their different roles within the creative process. Often perceived as the space where creation takes place (as a site of performance and exhibition), parabolic flights are first and foremost a space of experimentation (a "studio" or creative workshop) as well as the material for creation
- Conduct a preliminary aesthetic analysis of the works: what is their form, what do they say, how do they relate to contemporary art and to techno-scientific art in general, in what way are they "informed" by weightlessness and the environment that constitutes the flight, etc.
- Highlight the importance of these works within a broader artistic process
- Raise questions regarding the "visibility" and "legibility" of the
work

This symposium will gather artists and theorists as well as parabolic flight specialists, including:

Alex Adriaansens, director V2, Rotterdam
Marcel.li Antunez Roca, artist, Barcelona
Kitsou Dubois, artist, Paris
Kodwo Eshun, Anjalika Sagar and Richard Couzins, artists, London
Vadim Fishkin, artist, Ljubljana, Moscow
Flow Motion (Anna Piva and Edward George), artists, London
Jean-Pierre Haigneré, spationaut, Paris
Nicola Triscott and Rob LaFrenais, Arts Catalyst, London
Roger Malina, astronomer, director of Leonardo, Marseille
Takuro Osaka, artist, Tokyo
Marko Peljhan, artist, director Projekt Atol, Ljubjana
Frank Pietronigro, artist, San Francisco
Thierry Pozzo, researcher, Dijon
Mikhail Ryklin, philosopher, Moscow,
Denis Thierion, parabolic flight director, CNES, Toulouse
Louise K. Wilson, artist, London

Whether it is in the scientific, commercial or artistic field, space exploration introduces extremely diverse practices. This year, the @rt Outsiders International Festival 2003 proposes to investigate some of these practices within the world of contemporary art.

The sensation of weightlessness, of "floating," "flying," in three dimensions, of "holding still" without support and without fear of falling, is one of the more tenacious dreams, desires - fantasies? - and surely one of the chief reasons human beings succumb to the urge to venture outside of their native planet.

For many artists, creating work in, with, for or about this condition of “zero gravity” is an artistic re-examination extending far beyond the dream.

With the exception of a few cosmonauts or astronauts who are also painters, such as the Russian Alexei Leonov, to this day no artist has been able to “live” weightlessness in a durable fashion aboard a space station or the American space shuttles. On Earth, the parabolic flight remains the sole means of experiencing this unique condition.

In a parabolic flight, a specially equipped plane traces a series of parabolas in the air (bell-shaped curves with a 45° angle). In the “climbing” phase, gravity goes from 1-g (normal terrestrial gravity) to 2-g for 20 seconds before attaining the weightless phase at the “top of the curve” for approximately 25 seconds. During the “descent” phase of the flight, the plane returns to the 2-g phase for roughly 20 seconds. The cycle is repeated. Thus, the parabolic flight can be described as a succession of very short periods (2-g - 0-g - 2-g - 1-g) constituting a rather exceptional environment, where the experience of weightlessness is “framed” by moments of 2-g.

Although access to parabolic flights remains a challenge for artists, to date 22 artists have been able to work with and within this unique environment. Thus, we have a very diverse body of work and projects at our disposal (ranging from dance to performance, sculpture, painting, sound/music, video, etc.) by artists from different artistic horizons and diverse cultures (France, Japan, Spain, Russia, United States, Great Britain, etc...).

Within the category of space art, creation during parabolic flights constitutes a comprehensive subgroup that defines a “common base” from which to conduct an artistic and aesthetic analysis of these practices. This is the challenge of this symposium.

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