```
      /   ____
     /   /        /\
    /   /--    /__\
   /____/____ /    \
```

```
                 _____
                |              |
                |  CONTENTS    |
                |_____|
```

_____

EDITORIAL

< by Douglas A. Vakoch >

FEATURES

< Special Feature: Abstracts from Workshops on the Art and
Science of Interstellar Message Composition >

LEONARDO DIGITAL REVIEWS

< Buddhism and Science: Breaking New Ground, reviewed by Aparna
Sharma >

< Valie Export: Media Anagrams, reviewed by Yvonne Spielmann >

LEONARDO JOURNAL

< LEONARDO 36:4 (August 2003) - Abstracts >

ANNOUNCEMENTS

< Help Support Leonardo/ISAST >

ISAST NEWS

< Leonardo/ISAST Welcomes New Members to Boards >

< OLATS News >

_____

```
 _____
|               |
|  EDITORIAL    |
|_____|
```

_____

INTENTION, INTERACTION AND COMMUNICATION WITH EXTRATERRESTRIAL INTELLIGENCE

Douglas A. Vakoch, Director of Interstellar Message Composition
SETI Institute, 2035 Landings Drive, Mountain View, CA 94043, U.S.A.
vakoch@seti.org

Over the past 40 years, scientists and engineers have intermittently pointed large radio telescopes toward the heavens, conducting research programs in the Search for Extraterrestrial Intelligence (SETI). Recently, artists and scholars from the humanities have played an increasingly important role in discussions about what will happen if SETI succeeds. In the April 2003 issue of *Leonardo Electronic Almanac,* we examined the relationship between language and interstellar communication, as seen from diverse disciplinary perspectives. That issue featured abstracts of papers presented at two workshops on the art and science of interstellar message composition, held in Paris in 2002 and 2003.

This month, we examine interstellar message design through the related themes of intention and interaction, as seen in the abstracts of several of the papers presented at the Paris workshops as well as at a satellite workshop held in Zagreb in March 2003. During these meetings, authors from areas as varied as music, engineering, psychology, computer science and philosophy grappled with the questions "Can we say anything beyond 'Hello'?" and "Is there any way we can interact with another civilization if we don't have face-to-face contact?"

These questions reflect some of the greatest challenges of interstellar communication. Following the strategies used in modern SETI research, discussion during the meetings focused on methods of making contact via electromagnetic radiation, such as radio signals or laser pulses, both of which would travel between stars at the speed of light. Though there are no plans for sending signals in the near future - if ever - by discussing concretely the alternatives that are possible, the participants sought to address some of the most critical questions that would follow the detection of intelligent life beyond Earth: "Should we reply, and if so, what should we say?"

Tomislav Janovic, a philosopher at the Institute for Anthropological Research in Zagreb, proposed a modest goal for interstellar communication: simply to indicate the sender's intention to make contact. For true communication to occur, Janovic noted, it is not enough that information be transferred. One must also show that there is an *intent* to communicate. In Janovic's assessment, "attempts to convey an interstellar message with a rich informative content may be too optimistic regarding the decoding abilities of our potential addressee." Nevertheless, he remained sanguine that even communicating only the intent to make contact "could perhaps reveal more about the nature of our species than it may at first seem."

Many of Janovic's concerns were shared by William Edmondson, from the University of Birmingham's School of Computer Science. In his critique of traditional approaches to interstellar communication, Edmondson pointed out the many difficulties humans and extraterrestrials would need to overcome to establish a common ground of understanding. Consistent with Janovic's views, Edmondson suggested that we might start with the intention to communicate. Next, we could make references to objects known by both humans and extraterrestrials, such as prominent pulsars, an idea harkening back to the Pioneer plaques sent in the 1970s. The challenge is to point to objects when we do not have direct physical contact with another civilization.

Ideally, Edmondson said, we would like to have interactive communication. But given the immense distances between stars, that is simply impossible - at least if we construe interaction in the usual sense. But might it be possible to achieve interactivity without direct contact with another species? Might the capacity for interactivity be designed into the message itself?

One possible solution, discussed in SETI circles over the past 30 years, is to send computer programs. As early as 1972, at a SETI conference in the former Soviet Union, artificial intelligence pioneer Marvin Minsky made his case for the superiority of computer programs as interstellar messages. Computers, Minsky suggested, have the advantage of being interactive. Once you can convey the notion of basic computer code, and explain as simple an operation as addition, you have introduced a powerful tool that can be developed, step-by-step, to show increasingly complex processes, even including some aspects of human behavior. In Minsky's words, "It requires no other concepts because ETI are essentially building it for themselves and experimenting to see what it will do." By sending computer algorithms, we need not develop a foolproof scheme for laying out everything that we want to say. Instead, the recipient learns the computer language by using it.

Telecommunications engineer Brian McConnell pointed out one of the advantages of an algorithmic approach to interstellar message construction: it would let us "transmit intelligent programs that interact with their users in real-time, thereby partially solving the round-trip time delays imposed upon photonic communication by the speed of light." As McConnell noted, algorithms also allow multiple formats of messages to be combined, comparing the approach to using "desktop computers [that] automatically extract images, motion pictures, sound, text and other content types from digitally encoded files."

Such an algorithmic approach was advocated by psychologist Michael Matessa (NASA Ames Research Center) and myself for encoding concepts of reciprocity and forgiveness in interstellar messages. By supplementing algorithmic accounts of interactivity with three-dimensional animation sequences, they would also provide opportunities for the recipients to learn through observation, a central component of language-learning in humans and, research seems to indicate, in at least one related primate - the bonobo.

David Rosenboom, Dean of the School of Music at the California Institute of the Arts, had an alternative proposal for sending interactive messages. Rosenboom drew on analogies to experimental music composing, in which the creative process is the responsibility of both the "composer" and the "audience."

From this perspective, if we humans send out messages, some day extraterrestrial intelligent beings might become co-creators of those very messages through their engagement in decoding them. Instead of sending messages containing static, fully-formed representations, Rosenboom suggested that "sending processes that co-evolve - even in ways we may not be able to predict - may communicate far more about us." (Rosenboom has developed these and related ideas in his contribution to *Between Worlds: The Art and Science of Interstellar Message Composition,* a collection of original essays that will be published by the MIT Press in the Spring of 2004 as part of the Leonardo Book Series.)

But what would we do after showing our intention to communicate and developing methods of encoding messages, such as those that emphasize interactivity? If we succeed in understanding *how* to communicate, *what* would we want to say, and *who* should decide? The ideal interstellar message, many have argued, should represent humankind in its entirety, drawing upon insights from the broad international community. Although the most recent Paris message workshop included participants from ten countries, all but one of the attendees were from North America or Europe.

As a step toward more global inclusiveness, the Leonardo Network, the SETI Institute and the International Academy of Astronautics Study Group on Interstellar Message Construction will host a series of meetings on message composition in India during November and December 2003. At these meetings, scholars from throughout India will reflect on the scientific and cultural dimensions of composing interstellar messages, with a special emphasis on how we could convey notions of altruism - one of humanity's highest values.

The first meeting will be convened at the National Institute of Advanced Studies in Bangalore, located in the south of India. At the Bangalore workshop, biologists will review research that attempts to explain altruism in a range of animals, and philosophers of science will evaluate the strengths and limitations of these studies. Also in southern India, panelists at a bioethics conference in Chennai (formerly Madras) will highlight uniquely Indian perspectives on altruism. Finally, in northern India's New Delhi, over twenty eminent scholars in the sciences and humanities will examine the implications of constructing interstellar messages that focus on altruism as a defining human characteristic.

At the meetings in Bangalore, Chennai, and New Delhi, artistic perspectives on communicating altruism in interstellar messages are especially welcome. Participation in all events is by invitation only, with limited space for especially well-qualified individuals from outside India. Potential participants should send queries to <vakoch@seti.org>.

_____

```
        _____
       |                                 |
       |            FEATURE              |
       |_____|
```

_____

ABSTRACTS FROM THE PARIS AND ZAGREB WORKSHOPS ON THE ART AND
SCIENCE OF INTERSTELLAR MESSAGE COMPOSITION

_____

COMMUNICATIVE INTENTION AND INTERSTELLAR MESSAGE COMPOSITION

By Tomislav Janovic, Assistant, Department of Mathematical
Modeling and Biostatistics, Institute for Anthropological
Research, Amruseva 8, P.O. Box 290, 10000 Zagreb, Croatia.
janus@inantro.hr

An obvious problem with interstellar message composition is our
total ignorance regarding the cognitive/affective potentials of
the hypothetical recipient of our message. Being unable to get
around this handicap, a rational strategy seems to be a
minimalist one: (1) to agree on some minimum of information
content we want to communicate, with regard to (2) an assumption
about some minimum of cognitive/affective capacities needed to
understand this content.

According to an influential model of communication [1], for a
piece of behavior to be described as "communication" it is not
only necessary that some informative effect in the addressee be
produced (by her/his/its understanding of the content of the
message), but also that the communicator's intention to produce
this effect be recognized. These two necessary conditions taken
together are assumed to be sufficient for communication to take
place. It is thereby irrelevant whether the informative effect
is produced by verbal or non-verbal means. For understanding of
any kind of message - pictorial, tonal, gesticulatory or one
implying a rich, language-like syntax - the recognition of the
sender's communicative intention is indispensable. Such
recognition in turn requires certain "mind-reading" or
"empathic" abilities on the side of the receiver, enabling the
receiver to take up an "intentional stance" toward the sender
[2]. For, as it can aptly be illustrated by a variety of
examples, our understanding of "objective meaning" of the used
signs (in typical cases) does not suffice for efficient decoding
of a gesticulatory or a verbal message. It is the
"gesturer's/speaker's meaning" - what he/she/it intends us to
understand - what one has to recognize (or/and empathize with)
in order to get the message right (especially in cases of
clearly ambiguous messages).

Now in some specific cases of communicative behavior there is
no other content of the "message" besides the very intention to
communicate it. In other words, the content of the message is
the informative intention itself. The effect the sender thus
intends to produce is solely the recognition by the receiver of
her/his/its communicative intention. The important point is that
for understanding (decoding) such a "reduced" message the
requirements regarding the mental - both cognitive and emotional
- capacities of the receiver should be less demanding than in
cases of messages implying other, more complex informative
intentions. Some minimal mind-reading (empathic) capacities for
recognizing others' intentions can plausibly be assumed as
sufficient.

My speculation is this: attempts to convey an interstellar
message with a rich informative content may be too optimistic,
regarding the decoding abilities of our potential addressee,
thus violating the "minimalist strategy." Perhaps a more modest
communicative goal can be achieved in its own right: simply to

try to cause our communicative intention to be recognized. This could perhaps reveal more about the nature of our species than it may at first seem.

REFERENCES

1. H. P. Grice, "Meaning," in *Philosophical Review,* 66, pp. 377-388 (1957).

2. Daniel Dennett, *Brainstorms: Philosophical Essays on Mind and Psychology,* Montgomery, VT: Bradford Books (1978).

_____

CONSTRAINTS ON MESSAGE CONSTRUCTION FOR COMMUNICATION WITH EXTRATERRESTRIAL INTELLIGENCE

William H. Edmondson, Senior Tutor, Cognitive Science Research Centre, School of Computer Science, University of Birmingham, Edgbaston, Birmingham B15 2TT, U.K.
whe@cs.bham.ac.uk

When thinking about Communication with Extraterrestrial Intelligence (CETI), it is necessary to make assumptions. The minimal assumptions made here are that the "physics" of the universe is knowable locally, and that some general cognitive principles have universal applicability. Additionally, it is assumed that some aspects of cognitive functioning are necessary, and thus universal, corollaries of intelligent behavior: intentionality and distributed cognition. It is further assumed that the sensory apparatus of beings in the universe must deal with the dimensionality of existence, physical/chemical stimuli and the electromagnetic spectrum. It is not assumed that systems of explanation or of knowing are the same as ours.

General cognitive principles have been proposed that deal with the sequential imperative [1]: the need for atemporal cognitive entities to be mapped into and out of the sequential organization of behavior. Intentionality is required to constrain such mappings when they are not driven by physical contingencies, and such intentionality is readable by others. The sequences constituting behavior are often semiotically free and thus can serve to carry arbitrarily determined meanings (this can be layered, as noted by Hockett in his "double articulation" language design feature [2]). Aesthetics is potentiated in such a system as yet a third layer of articulation, akin to pragmatics in the narrowly linguistic sense.

Information is the distinction between what is and what might have been, and contextualization is required both for the determination of "what is" and the relevant "might have beens." The notion of a message and its transmission as a model of communication is flawed on pragmatic grounds but remains common [3,4]. Successful contextualization depends upon situation awareness and at least the implicit exploitation at some level of distributed cognition [5]. In this account, communication is a participative endeavor constantly exploring the limits of shared understanding.

CETI requires participation and engagement rather than witness and deduction. Time and space present problems, of course, but one way to overcome the difficulties is to assume an intention to communicate and to begin an interaction, and to do this it is necessary to announce one's presence. CETI should begin there. Using stellar objects known as pulsars provides the possibility of explaining to an ETI one's location in space in absolute terms, thus knowingly and knowably giving expression to the need to help one's interlocutor by thinking of their needs. This establishes shared understanding of the need to share references, and on this basis other aspects of message construction can be elaborated.

This pattern of reasoning readily evokes the prospect of altruism (in the sense of thinking of others), perhaps because the more noble sense of this concept itself derives from or reflects a heightened state of situation awareness. However, to go much beyond these observations seems likely to lead to fanciful notions of communicating the nobility of humanity (a doubtful premise) or the beauty of Bach (a pointless phantasy grounded in ignorance of the cultural and physical relativities involved in human existence). That one's ET interlocutor could know beauty in an artifact or behavior is probably not in doubt, but that they could know why a human finds a Caro sculpture or a Rembrandt etching or a Berlioz opera movingly beautiful, or come to share that appreciation, is deeply improbable. Knowing this limitation is an additional and important constraint on message construction.

REFERENCES

1. See W. H. Edmondson, "General Cognitive Principles and the Structure of Behaviour," Technical report CSRP2000-13, School of Computer Science, University of Birmingham, 2000. Available at: http://www.cs.bham.ac.uk/~whe/seqimp.pdf. See also N. Chomsky, *Rules and Representations,* Basil Blackwell, 1980.

2. C. F. Hockett, The Problem of Universals in Language (1965), in *Universals of Language,* Joseph H. Greenberg, ed., 2nd edition, MIT Press. See also Hockett's 1961 paper: "Linguistic Elements and Their Relations," in *Language* 37, pp. 29-53.

3. A. Akmajian, R. A. Demers, R. M. Harnish, *Linguistics: An Introduction to Language and Communication,* MIT Press, 1984.

4. M. D. Hauser, *The Evolution of Communication,* MIT Press, 1997.

5. E. Hutchins, *Cognition in the Wild,* MIT Press, 1996.

_____

ALGORITHMIC COMMUNICATION WITH ETI AND MIXED MEDIA MESSAGE COMPOSITION

Brian S. McConnell, McConnell and Associates, 841 Corbett Avenue, San Francisco, CA 94131, U.S.A.
brian@mcconnell.net

Algorithmic Communication with Extraterrestrial Intelligence (ACETI) builds upon mathematical languages such as Hans Freudenthal's *Lincos* to create a general purpose programming

language that is derived from a small collection of fundamental symbols based on elementary math and logic elements. The underlying framework is simple, and can be taught to anyone who is knowledgeable in basic math and logic.

One of ACETI's most interesting applications is the ability to interleave many types of information within a single data stream. Because the data stream contains algorithms that direct the recipient's computer in processing the message, the sender can combine many different types of presentations. This is not without precedent since desktop computers automatically extract images, motion pictures, sound, text and other content types from digitally encoded files.

By teaching the recipient to recognize a basic programming language that runs on a virtual machine, the sender can send bootstrap programs that are designed to recognize and decode different types of content, without requiring the recipient to understand the details of how the extraction programs function.

Such a framework could be very useful in transmitting cultural information that cannot be expressed in terms of equations or low-resolution bitmaps. This approach could also be used to transmit intelligent programs that interact with their users in real-time, thereby partially solving the round-trip time delays imposed upon photonic communication by the speed of light.

_____

MODELING RECIPROCAL ALTRUISM AND FORGIVENESS IN INTERSTELLAR MESSAGES: A POPULATION-BASED APPROACH

Michael P. Matessa, Research Psychologist, NASA Ames Research Center, Mail Stop 262-4, Moffett Field, CA 94035, U.S.A.
Michael.P.Matessa@nasa.gov

Douglas A. Vakoch, Director of Interstellar Message Composition, SETI Institute, 2035 Landings Drive, Mountain View, CA 94043, U.S.A.
vakoch@seti.org

In this paper, we expand upon our earlier work in algorithmic modeling of reciprocity and forgiveness for interstellar message construction, moving from an account of a series of interactions between individual agents to an account of random sampling of individuals within populations using varied strategies. These agents need to sustain a certain body weight to survive. If agents fall below a critical weight, they cease to exist in subsequent trials. The program is designed to communicate that issues of reciprocity and forgiveness, sharing and taking, are not merely strategies for winning abstract games, but are vital to the agent's continued existence. One goal of this simulation, then, is to show that the agents that use these strategies are finite, corporeal beings.

Both the code and multiple examples of the sort of output that can be generated would be transmitted, but because an element of randomness is included in the program, any sample output would not correspond to any given run of the program. To make clear the link between a program and its output, however, specific examples of this link are shown in simpler, deterministic

programs, in which the program specifies the output exactly.

On each turn, each agent has two choices: it can either defect or cooperate. In this message, this is indicated through food-sharing or attempting to get all available food for oneself. Consistent with the Prisoner's Dilemma, if one agent shares while the other attempts to get everything for itself, then the sharer actually loses, while the greedy agent gains. If both are greedy, both lose, but to a lesser extent than if one is greedy while the other shares.

But life does not consist of one-time interactions. Often we have opportunities to meet the same person again. While defection may work when the other agent thinks you will cooperate, once an agent gains a reputation as a defector, it may be much more difficult to take advantage of the other. Our message sequence models this aspect of reality through repeated interactions between agents randomly selected from a population of agents that use different strategies, with memory for the actions of previous agents.

When we can show a series of interactions between agents, and memory for what happened last time, then there are opportunities for expressing gratitude for earlier sacrifices and chances for retribution. We can also describe agents who periodically "forget," but always in the best interests of the other agent. In the latter case, we can model a simplified version of forgiveness, which can be an effective long-term strategy in certain populations. While agents who always reciprocate a negative action by another agent might end up in maladaptive cycles, ultimately fighting one another to the death, those who can forgive and forget may survive. We show how these various scenarios can be modeled in interstellar messages through computer programs as well as three-dimensional computer animations.

———————————————————————————————

THE IMPERATIVE OF CO-CREATION IN INTERSTELLAR COMMUNICATION: LESSONS FROM EXPERIMENTAL MUSIC

David Rosenboom, Dean of the School of Music, California Institute of the Arts, 24700 McBean Parkway, Santa Clarita, CA 91355, U.S.A.
david@shoko.calarts.edu

It may be an important principle in extraterrestrial communication (ETC) to create interactive, not fixed, messages that communicate our current understandings about the emergence of intelligent life. Co-creation may be the only way intelligent entities not sharing a common language can communicate. In so doing, they create the basis for new language. Such practice is common in music-making. The author offers points of view on this and the following ideas drawing on examples and experiences in experimental music composition.

Traditional approaches to composing messages for ETC often suffer from the requirement of concurrent imagination for the recognition of signs. To accurately represent an object, the communication object must be the *thing itself,* rather than a sign of a significant. Otherwise, the relationship between the two has to be imagined. Communication, then, only takes place if the imaginations of the various parties in communication are

then the same. This is a serious matter for communication to take place among unknown intelligences, the nature of which we cannot know in advance. An approach to correcting the problem might be to imbed the thing being communicated about inside the structure of the communication. Music involving emergent processes, in which the forms that emerge are the *things* themselves, may provide examples.

Sending processes that co-evolve - even in ways we may not be able to predict - may communicate far more about us than sending signifiers of cultural or scientific objects. In composing such processes, we must recognize that co-evolution involves the generation of spontaneous order plus selection, with adaptation leading to the unmistakable identity for the adapting agent. Furthermore, an adaptive agent's efficacy is increased if all the rules for adaptation are always considered hypotheses under continuous testing and verification, with alternative hypotheses always ready to be tried when contradictions are revealed, rather than attempting to make new rules achieve consistency with other rules modeling the environment. This is especially important in open, co-creative communication.

The author offers speculations on how to compose and transmit interactive processes within the limits of using electromagnetic fields. These include sending specifications for materializing interactive process, employing extended time forms, recognizing shared dynamics and covariance among systems as communication, and avoiding thinking in terms of linear time and concurrent imagination. Principles for composing interactive processes are suggested along with their possible means of transmission over large-scale time-space domains.

True co-creative, interactive, co-communication may only be possible among forms of intelligence in which empathy and altruistic behavior has ascended through the natural forms of evolution. Deep consideration of ETC demands that we question how we might best focus our work on this highest imperative of evolution. Can human beings serve as an agency for such evolutionary advancement? The development of high orders of self-consciousness would seem to be required. Acquisition of deep self-knowledge - from this perspective - seems a primary prerequisite for the evolution of consciousness, and in turn, a prerequisite for all higher human evolution. This may also be a requirement for ETC to succeed.

_____

```
        _____
       |                                 |
       |    LEONARDO DIGITAL REVIEWS     |
       |             2003.07             |
       |_____|
```

_____

This month's Leonardo Digital Reviews is comprised of five lengthy contributions by panel members from India, the U.S.A., the U.K., Belgium and Germany.

This cosmopolitan collection leads with a review article by Aparna Sharma, stimulated by B. Alan Wallace's new book, *Buddhism and Science: Breaking New Ground.* Sharma situates the argument in its historical context, as a personally informed understanding of Buddhism as a practice and as a convenient

short-hand in Western critical studies. Such reduction has its place and Amy Ione's enthusiastic support for Rita Carter's accessible insight into some of the preoccupations of consciousness studies is a particularly welcome introduction to the topic for beginners. Issues of consciousness, perhaps not surprisingly for regular readers, also underpin Robert Pepperell's equally enthusiastic support for *Potential Images,* Dario Gamboni's intervention in art history. Dorothea E. von MŸcke's overview of the seductions of the occult are welcome in bringing all three discussion together in what is, overall, one of the most useful contribution to the emerging debates. Stefaan van Ryssen reviews *SETI 2020: A Roadmap for the Search for Extraterrestrial Intelligence,* edited by Roland D. Ekers et al., with his customary wit engaging as ever, even to those not interested in the subject. Finally, to complete this collection, Yvonne Spielmann tackles a number of the complex issues that *Valie Export* poses for the telling of the story of media art relative to a larger vision of what was and is going on in that field.

All these and previous reviews are at:

http://mitpress.mit.edu/e-journals/Leonardo/ldr.html

Michael Punt
Editor-in-Chief
Leonardo Digital Reviews

_____

LEONARDO DIGITAL REVIEWS - JULY 2003

Buddhism and Science: Breaking New Ground, edited by B. Alan Wallace
Reviewed by Aparna Sharma

Exploring Consciousness, by Rita Carter
Reviewed by Amy Ione

Potential Images: Ambiguity and Indeterminacy in Modern Art, by Dario Gamboni
Reviewed by Robert Pepperell

The Seduction of the Occult and the Rise of the Fantastic Tale, by Dorothea E. von MŸcke
Reviewed by Michael Punt

SETI 2020: A roadmap for the Search for Extraterrestrial Intelligence, edited by Roland D. Ekers et al.
Reviewed by Stefaan van Ryssen

Valie Export: Media Anagrams (German title: "Mediale Anagramme"), edited by Neue Gesellschaft
Reviewed by Yvonne Spielmann

_____

BUDDHISM AND SCIENCE: BREAKING NEW GROUND

Edited by B. Alan Wallace, Columbia University Press, New York, 2003. 444 pp., ISBN: 0-231-12334-5; 0-231-12335-3.

Reviewed by Aparna Sharma, New Delhi, India.
Aparna31S@netscape.net

At a recent audience, the 13th Tai Situpa Rinpoche of the Kagyu lineage of Tibetan Buddhism took issue with the efficacy of a discourse among an audience not conversant with his native dialect. His concern was that vocabularies of languages other than ancient Pali, Prakrit, Sanskrit (the languages in which most Buddhist texts are written) or their immediate derivatives are too immediate and communicate a rather hasty and passing meaning of the subject. In the process, meaning only gets straight-jacketed, closing doors to interpretations and interrelations regarding the particularities of a given context.

Buddhism and Science: Breaking New Ground, is an anthology of essays mapping the engagements and intersections between Buddhism and modern science, which overcomes the restrictions that Tai Situpa Rinpoche cautioned against in relation to the fields it engages with. Its scope spans a wide panorama of topics such as quantum theory, lucid dreaming, relativity and imagining, which are discussed along with aspects of Buddhist philosophy.

Apart from His Holiness the Dalai Lama and his principal interpreter, Thupten Jinpa, who has had an education in traditional Tibetan Buddhism as well as in the Western academic tradition, other contributors to this edition are primarily Western scholars who have had involvement with Buddhism. Some have been Buddhist monks and have spent substantial periods of time practicing in the sub-continent while a few have participated in conclaves with His Holiness to interact and exchange on issues concerning their disciplines. The book's approach is thus not necessarily orientalist, in a manner that would view Buddhism as culturally specific, or peculiar.

Before looking into some of the book's contents and approach, it is vital to recall the factors that will enable us to more specifically locate this work and the dialogue itself, as pointed out by Jos□ Ignacio Cabezon, a professor of Tibetan Buddhism and cultural studies at the University of California. Cabezon identifies the following factors: first, the interactions between Buddhism and science are far more specialized today than they were, say, 15 years ago. Second, the shift in the intellectual ethos of the West, which has resulted in a decline of resistance towards the contemplative sphere/s. Third, sociological factors, a prominent one being the spread of Buddhism to the West.

Although *Buddhism and Science* is informative, intense and cogent, it makes for only an opening to the intersections between its subjects. The book starts with a historical overview and the essays thereafter examine specifically the underlying assumptions of Buddhism and science, drawing parallels between the two. These parallels constitute spaces where scientific concepts have been explicated with resonance of Buddhist principles of understanding phenomena, and vice versa. While for any sustainable dialogue it is necessary to map the points of congruence and departure between the participating spheres - particularly in this case, where the two were long considered diametrically opposite - that in itself appears insufficient to constitute a dynamic and mutually beneficial flow or exchange.

Buddhism and Science refers to Buddhist philosophical notions and practices, such as meditation, but the engagement with some concepts could have been deeper in order to bring forth their

interrelations and links with the Buddhist philosophy as a whole. The process of entification has been emphasized throughout most of the book and the interdependence of phenomena is repeatedly discussed. The arguments developed in relation to the theories of relativity and quantum mechanics are particularly useful. However, what appears as an isolationist tendency, that is, referring only to particular aspects of Buddhist thought, bears the risk of undermining the complimentary nature of the various Buddhist teachings. This may further prompt, unintentionally, an incomplete and thus incompetent understanding of the subject.

For example, in his essay investigating "identity" to unpack the dynamics of human-inflicted suffering, William S. Waldron, who teaches South Asian Religions at Middlebury College, states that nations, societies, individuals and cultures are reified into selves or entities, defined by a divide between "us" and "them," or the "other." He adds that the assertion and protection of these entities requires the play of evil. In his deconstruction of the mechanisms of evil, Waldron locates and draws upon the concurrence between evolutionary biology and Buddhism, arguing that energies from past activities and dispositions at birth incline individuals to act in certain ways. Being the product of biological evolution, humans' conscious and unconscious goals are rooted in the activities and goals of their ancestors.

Waldron's attempt bears currency in the present global political backdrop, wherein conflicts are no longer so much national or territorial as much as they are rooted in civilizational identity, which is rather inflexible. And though his conception resonates with the Buddhist understanding of the process of entification and identity formation, his involvement with evolutionary biology is such that he scantily addresses the cyclical conception of human birth in relation to the finely detailed Buddhist conception of *karma,* operating both at the level of an individual and collectively.

Similarly, Matthieu Ricard's essay, which delves into more subtle territory for clarifying what comprises consciousness, contests the neurobiologist's view, according to which consciousness emanates from the constant interactions with the outer world. By pointing at this inadequacy, Ricard is not simply bringing forth the long-running conflict between idealism and materialism, but is in a manner pointing to the futility of such a dualism. He argues that this dualism, according to Buddhism, does not exist in the first place because, "neither consciousness nor the world of material phenomena have any intrinsic reality." (p.273) Ricard acknowledges a non-material component in the continuum of what constitutes consciousness and goes on to make a case for a contemplative science. But his assertion that consciousness can "undergo major changes quiet easily" (p. 270) in a sense reflects a cursory understanding, undermining the interplay of other key conditions for holistic "transformation."

Ancient wisdom from the Indian sub-continent has held consciousness as commanding the faculty of relative as well as absolute self-awareness. The prescribed Buddhist practices and their methodologies are aimed towards such an end, and are universal. However, a practitioner's evolution is based not only on immediate engagement but also on other factors, such as predisposition or interaction with the environment. Consequently, there emerges no common denominator with regard to

the duration or impact of the prescribed practices, which act upon different levels of consciousness, often operating through very subtle modes.

The concept of *karma* is at the core of the Buddhist tradition and is embraced unequivocally by its various schools. Its opaqueness, here in relation to the scientific community, could be attributed to either inept communication on behalf of its proponents or its perception as a mystical formation, impassable to those not belonging to the cultures of its origin. Other concepts and practices central to Buddhism, such as those making use of silence, mantras and chants as well as more abstract notions such as discussions of the *cakras* or prayer as non-mediated dialogue, may on immediate glance defy relevance and evade physical verification. However, they are vital, simply because they are intricately enmeshed within the philosophy and are regarded as occupying a functional role in it.

The intention in pointing to these areas is merely to highlight unexplored territory in terms of a dialogue - one that may go on to be based not solely on concurrence, but one that would be more exciting if it were also to bring in the realm of contestation and disputation, under whose impact both the subjects could cultivate their understandings by abandoning aspects that cannot be corroborated through the rigorous methodologies of either. Either could adopt positions and insights from the other.

Further, with respect to a dialogue between science and any spiritual-philosophical tradition (not only Buddhism), as vital as the physical and cognitive sciences are, comprising the principal areas of convergence between Buddhism and science, without an involvement of the life and bio-sciences this effort may not be completely lacking, but it will not be complete either. This is particularly so given the onus on the mind, which is regarded as one level of existence related to others - the body and breath. The distinction between these different levels is purely organizational: they constantly interact and bear impressions on each other.

Within the framework of the life sciences, new insights into the scope and effects of Buddhist practices could be revealed profoundly, as well as in more tangible terms. Sitting meditation, as well as other ancient Indian practices, such as cultivation of *samadhi* [see LEA, Vol. 11, No. 2, Feb. 2003, "Samadhi: The Contemplation of Space," by Robert C. Morgan - ed.], do not just interrupt the constant loop of thoughts stemming from action, experience and observation; with sustained practice, they go on to explicate and enforce the essential continuity of all physical forms and phenomena. Research into specific practices has revealed an increase in the rate of Beta activity in the brain, which is said to cause "higher and relaxed alertness." Newer disciplines, especially in medicine, such as Psychoneuroimmunology and mind-body science, are emerging to collate and understand findings on consciousness that do not only refer to physical or bodily attributes.

This engagement with science is therefore not necessarily done in order to verify the credentials of Buddhist practices or to deconstruct and make accessible the philosophical notions of Buddhism. It is a means through which both spheres can come to each other's assistance in order to comprehend existence and man's position within it. *Buddhism and Science* is a welcome platform, which brings its subjects to interact and manages to

locate equations between both. Despite some of its limitations, it is a crucial work constituting a foundation for advancing future efforts that may capitalize on the agreements in it to dive deeper and further examine the assumptions and methodologies of both fields.

_____

VALIE EXPORT: MEDIA ANAGRAMS (GERMAN TITLE: "MEDIALE ANAGRAMME")

edited by Neue Gesellschaft, Bildende Kunst publishers, Berlin, Germany, 2003. 224 pp., illus. ISBN: 3926796.

reviewed by Yvonne Spielmann, Institute of Media Research, Braunschweig School of Art, Germany.
spielmann@medien-peb.uni-siegen.de

Valie Export was one of the founders of contemporary media art in Europe. Over the decades, her multimedia work has included performance, feature film, film live action, experiments with camera and Expanded Cinema, installations, video, photography and recently, digital photography. In the 1960s, she was the only woman among the Vienna Group of action artists. Moreover, as a woman artist under the influence of the then-emerging feminist thinking, she used her own body and overtly displayed female sexuality in order to aggravate moral standards and public order, gender discrimination and dominant patriarchal discourse. Her early performances and films placed emphasis on painful, overtly sexual and self-reflexive experiences of the female body. She underlines body-awareness in site-specific photography, where she places herself in the city landscape as if wrapping around buildings and steps. In her photography, film, and performance, Export shows not only the masturbating woman, but also the encounter of her naked body with an electric fence, reflecting the status of woman as artist in repressive post-war Austrian society. This stance, in accordance with the Vienna Group, needs to be seen as a personal response to a society that is hardly digesting its Nazi past. Export's overriding concern is with dismantling media representations through making visible and audible the construction of realities that shape our perception of the work, thereby sometimes taking the physical experience of her own body to the limits.

Export understands media art as social criticism and deliberately uses different media languages in order to explore and express borderlands of mediated and real realities. Her ongoing concern as a media artist lies in the reflection of zones and in-between spaces of media, arts and society, places where media merge with each other and identities multiply. As part of this strategy and, in an act of cutting off the pre-defined identity that was attached to her through bearing the name of her father, the artist deliberately chose the name Valie Export, like a brand name and a tag. When, in a 1970 photographed self-portrait she holds a cigarette packet bearing the logo "Valie Export," she demonstrates her own identity as a media program to scrutinize the conflict between self and media, between the tools and the cultural conditions of representation. By exposing her new identity as a brand name in capital letters, Export is by the same token selling a "product" and multiplying her "self" through a cultural process of transfer and transformation of becoming someone else.

Throughout 2003, the Academy of Arts in Berlin is showing some

of Export's major works, compiled from earlier conceptual pieces, experiments with film and photography, performances, expanded cinema and video installations of all her periods of production. The work presented in the exhibition and additional text materials by the artist are documented in the catalog *Media Anagrams,* together with a series of theoretical articles that reflect on different aspects of Export's media interventions from the late 1960s up to today. The analytical articles in the catalog build up a theoretical frame that corresponds with Export's own theoretical writings, especially where the artist explains the diversity of her approach, saying that the medium itself is not the message - that is, a medium is no longer "one" single message.

In a well-known essay (not included in the catalog), Export defines the body in terms of "the real and the double". She here explicitly states her conceptual principle that enunciation always involves the double, the other. The borders between different realities are shifting. Logically, Export uses the multiplicity of media, fragmentation of media language and reflection on media representation as strategies to make the viewer aware and sensitive to the different levels of media, representation and physicality of the body. Most of the articles take up the critique of representation that Export strongly deploys throughout her work, regarding the expression of her principles in using different media and in presenting the work in different environments, such as galleries, public spaces and cinema screenings.

Roswitha Mueller, in discussing Export's concept of body, refers to feminist discourses where the split of reality and self is analyzed as a typical experience of women in our societies. This is an experience that starts from childhood, reproduced and countered in Export's actions of cutting, where she literally severs the past, a process seen as a necessary prerequisite to finding and defining her own identity. Cutting, which involves injury and pain of the body, is thus carried out by Export in the realm of body art. As Mueller states, the artists' idea of expanded body refers to postmodern theories of circulation of signs as well as to the notion of constructedness through power relations and historical connotations, a notion that takes up Foucaultian thinking. Through pain, as Export seeks to demonstrate, the strangeness of the female body in our society becomes strikingly apparent. Thus, much of her early performance work (where she bleeds and is struck by electric wires) needs to be understood as a process of self-awareness turning into self-determination. This is highlighted when in "Body Sign Action" (1970), Export lifts her dress and shows off the tattoo of a suspender on her upper thigh.

Ideas of "expanded" body overlap with concepts of expanded media, particularly in Export's cinema actions of the late 1960s and early 1970s, mostly performed together with Peter Weibel in the streets of Vienna. Marlene Streeruwitz, in her article on the Austrian context, draws on the famous street actions where, for example, Export "walked" Weibel on all fours with a long leash. Marc Siegel and Gertrud Koch discuss Export's role as a filmmaker of experimental feature-length films, most prominently *Invisible Adversaries* (1976), where she understands film practice as an analytical discourse of gender relations and explorations into space. Export's focus on space, urban structure and city architecture in her work has primarily developed in her photographic approaches where, similarly to her films, she uses superimposition to visualize the "split in

reality." As Silvia Eiblmayr underlines in her article about body configurations, it is Export's concern to make visible the split in reality between a given context and the constraints of subjectivity. Again, Export uses the media as a tool to differentiate between the media context and its representational system, through dislocations, superimpositions and sharp cuts. It is this series of devices that taken together express both, the real and the double. When Export, in photographs of the seventies and eighties, wraps her body around street corners, staircases and columns, or when she inserts a geometrical form into landscape pictures, or even points with her finger into the picture field, Export always intervenes into the representational mode of media images.

The collection of essays in the catalog and its selection of a wide range of illustrations documenting the phases of development and the diversity of media encounters over the past decades provides a solid overview and insight into the aesthetic principles of one of the most interesting contemporary media artists. As Sigrid Schade states in her essay, Export has always worked with new media (video, and later digital photography) in ways that explore and thematize the media themselves. On the whole, Export's conceptual approach is a critical encounter with a narrow understanding of media arts. Hers is intervention, an approach that is emphasized, explained and analyzed in the comprehensive essays of this well-illustrated book.

_____

```
                    _____
                   |                               |
                   |       LEONARDO JOURNAL         |
                   |_____|
```

_____

LEONARDO 36:4 (August 2003) - ABSTRACTS

_____

THE SPIRIT AND POWER OF WATER PROJECT

Iba Ndiaye Diadji: From "Life-Water" to "Death-Water" or On the Foundations of African Artistic Creation from Yesterday to Tomorrow

The question of water crosses all African cultures - water as the critical factor for a happy life (life-water) or water mastered as a source of malediction (death-water). The aquatic nature of such a civilization appears then as the foundation of shapes and contents of African artistic expression. An analysis of various forms of creation shows that, without a lucid understanding of the power of water in the constitution of Africa's identity, it is impossible to interpret correctly African art from yesterday to tomorrow.

_____

ARTIST'S ARTICLE

Steve Mann: Decon2 (Decon Squared): Deconstructing Decontamination

Decon is short for decontamination (e.g. stripdown and washdown in response to anthrax scares, etc.), but the term "decon" is also a short form for "deconstruction" (literary criticism asserting multiple conflicting interpretations of philosophical, political or social implications, rather than an author's intention). The author describes an anthrax-ready mailroom exhibit that included mass casualty decontamination showers, which he built in the summer of 2001, based on a patent he filed in April 2000, to deconstruct the coming "war on terrorism" and the suspension of civil liberties and personal privacy that might follow in the wake of bioterror attacks.

_____

GENERAL ARTICLE

Cr□tien van Campen and Clara Froger: Personal Profiles of Color Synesthesia: Developing a Testing Method for Artists and Scientists

The authors describe a practical method for assessing personal profiles of color:word, color:taste, color:music and color:odor synesthesia. The Netherlands Color Synesthesia (NeCoSyn) method is based on the Swedish Natural Color System and the test of genuineness for colored-word synesthesia developed by Baron-Cohen et al. The NeCoSyn method has been tested scientifically and shown to reliably distinguish different types of color synesthesia. It provides individual profiles of color synesthesia in the dimensions of hue, chroma and blackness. This article describes the method and discusses possible applications of NeCoSyn profiles in different fields of the arts and sciences.

_____

HISTORICAL PERSPECTIVE ON THE ARTS, SCIENCES AND TECHNOLOGY

Michael John Gorman: Art, Optics and History: New Light on the Hockney Thesis

David Hockney's recent book *Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters* argues that 15th-century painters employed optical devices to achieve realistic portraiture. A reexamination of the history of optical projection techniques raises problems for Hockney's provocative hypothesis.

_____

SPECIAL SECTION - INTERSENSES AND NEW TECHNOLOGIES

Franois Delalande: Sense and Intersensoriality

Intersensoriality is part of the more general problem of musical meaning: How does sound relate to something outside of the world of sound? If we distinguish the "form" of sound from its "matter," the discussion can then be divided into two parts. First, how can sound forms (shapes, profiles) suggest other temporal forms, such as movement? The hypothesis developed here is that sensorimotor experience is generalized to furnish a base, in successive layers, for identifying suggested movements that are more and more abstract. Secondly, how can a sound be said to be "hot" or "cold," "dark" or "clear"? Metaphors concerning the matter of sound deal with a common level of

synesthesia; a few stages of the historical study of this
phenomenon are recalled here.

Rolf Inge God¿y: Motor-Mimetic Music Cognition

Music appeals to more than just our sense of hearing, and
clearly we often associate other sensations with music. These
non-sonorous sensations seem to be inseparable from the
experience of music; in particular, images of movement appear to
be deeply embedded in our perception and cognition of music.
Explorations of mental images of music-related movement could
enhance our understanding of music as a phenomenon, as well as
be of practical value in various music-making tasks.

Jean-Pierre Ternaux: Synesthesia: A Multimodal Combination of
Senses

Synesthesia is an unusual phenomenon that is occasionally
reported in artists and writers. In its pathological context,
synesthesia is described as a confusion of the senses where the
excitation of one sense triggers stimulation in a completely
different sensory modality. In contrast to this pathological
form, synesthesia can also be considered as a physiological
behavior that involves a multimodal combination of all senses.
Such an expression of sensory perception can also be considered
as a natural process that contributes to the adaptation of the
living organism to its environment. The author attempts to
analyze the cerebral mechanisms involved in sensory perception
and synesthesia.

_____

                    _____
                   | |
                   | ANNOUNCEMENTS |
                   |_____|

_____

HELP SUPPORT LEONARDO/ISAST

Dear Members of the Leonardo Community,

I am writing today to ask you to join me in supporting
LEONARDO/The International Society for the Arts, Science and
Technology. Like me, you are devoted to promoting development
and connections in art, science and technology. As the
preeminent professional social network linking practitioners and
researchers together, Leonardo is the community that we rely on
to support our growth and knowledge in this field, and to
provide us with cutting-edge information that no other source
offers.

To be perfectly frank, the very existence of Leonardo/ISAST is
in danger. With the recent economic downturn, some of our most
devoted supporters are unable to offer the assistance that we
have grown to rely upon. Without the support of our community,
Leonardo/ISAST may lose its ability to provide you with access
to the most forward-thinking minds in our field. You can help
out now by going to
http://mitpress.mit.edu/Leonardo/isast/donations.html or by
sending your gift to Leonardo/ISAST at 425 Market Street, 2nd

floor, San Francisco, CA 94105. (All donations are fully tax-deductible.)

I have served as a Leonardo/ISAST Board member for four years and as Chair of the Leonardo Book Series since 2000. In that time, I have confirmed how crucial Leonardo is to the careers and interests of artists, scientists, engineers and scholars working in our field. The cultural convergence of art, science and technology provides ample opportunity for artists to challenge the very notion of how art is produced and to call into question its subject matter and its function in society.

Articles in Leonardo/ISAST publications are read in over 40 countries across the world. In the past year, in addition to publishing Leonardo, Leonardo Music Journal, Leonardo Electronic Almanac, and Leonardo Digital Reviews, Leonardo/ISAST, in collaboration with MIT Press, also produced two more books in the Leonardo Book Series: *Uncanny Networks: Dialogues with the Virtual Intelligentsia,* by Geert Lovink and *Virtual Art: From Illusion to Immersion,* by Oliver Grau.

We were present at the ISEA (Inter-Society for the Electronic Arts) conference in Japan, SETI (Search for Extraterrestrial Intelligence) workshop in Paris, and CAA (College Art Association) in New York. We developed new initiatives, including Global Crossings: Cultural Roots of Globalization, the LEA Educators Initiative and ArtsLab. Our plans for the future are equally exciting, including new benefits to members of our community in terms of facilitating collaborations and ensuring quick access to the most stimulating developments in the field, as well as maintaining the highest standards of excellence in our archival journals. But these new initiatives will only happen with the active participation of our community.

The complexity of the times is upon us both technically and culturally. The need for cross-disciplinary ferment, new forms of collaboration and hybrid research enterprises designed to bridge the arts, sciences and technology disciplines is essential to making sense of a rapidly transforming world. Explorations of technology by artists-researchers serve to illuminate not only the potentials of emerging technology but also new structures of production, cooperation, and distribution. Leonardo/ISAST, through all of its activities, provides context for understanding the language and agendas of their production and research.

Leonardo exists because supporters like you are interested in the art and artists of the future. But while our global presence and prestige increases, our primary funding sources are feeling the burden of the present economy. Now more than ever, Leonardo needs your help. Our existence has never had greater international impact nor been more at risk. We recognize the role you've played in Leonardo's past and invite you to be a part of Leonardo's future.

Joel Slayton
Leonardo/ISAST Governing Board Member
Chair, Leonardo Book Series
Director, CADRE Laboratory for New Media

P.S. Your donation of $1000 will make possible the publication of an artist-researcher's article in Leonardo. $500 will sustain our Reviews project for a month. $100 will offset the mastering of one track on this year's Leonardo Music Journal CD.

Visit http://mitpress.mit.edu/Leonardo/isast/donations.html to
support Leonardo/ISAST today!

_____

```
      _____
     |                               |
     |          ISAST NEWS           |
     |_____|
```

_____

LEONARDO/ISAST WELCOMES NEW MEMBERS TO BOARDS

Leonardo/The International Society for the Arts, Sciences and
Technology (ISAST) is pleased to announce the addition of five
new members to its Governing Board, International Advisory
Board, and Leonardo Editorial Board - Anne Pfister, Michael
Grey, Sundar Sarukkai, Julio Bermœdez and Douglas A. Vakoch.

Anne Brooks Pfister and Michael Joaquin Grey will join the
Leonardo/ISAST Governing Board, a group that consists of
prominent figures in the fields of art, science and technology.
The International Advisory Board welcomes Sundar Sarukkai from
India and Julio Bermudez from Argentina to its ranks of art-and-
science luminaries throughout the world. Governing Board members
meet face-to-face at regular meetings several times a year,
whereas International Advisory Board members communicate via e-
mail and telephone on an ad-hoc basis. Both groups participate
actively in reaching decisions for Leonardo/ISAST. Douglas A.
Vakoch will enter service on the Leonardo Editorial Board, a
group of experts in the fields of art, science, and technology
who determine content for the journal *Leonardo.*

ANNE PFISTER AND MICHAEL GREY
ANNE BROOKS PFISTER holds degrees in biochemistry and molecular
biology, as well as art history, and is currently employed at
the Mathematical Sciences Research Institute in Berkeley.
Pfister's background is in marketing, both for science and arts
organizations, and in both the non-profit and commercial
sectors, including experience at KALA Institute, Quantum Dot
Corporation and Onyx Pharmaceuticals. She is active on the Board
of Directors of the University Art Museum Council, UC Berkeley,
and as a volunteer judge for the Berkeley Middle School Science
Fair Program. She is eager to bring a Latino perspective to the
Governing Board of Leonardo/ISAST.

MICHAEL JOAQUIN GREY is an artist, designer, inventor and
entrepreneur best known for his popular and highly acclaimed
educational toy, ZOOB. Winner of honors from ID Magazine,
Consumer Reports, Dr. Toy, Family Life Magazine, Astra and the
American Toy Institute Award, ZOOB merges genetic engineering
with tinker toys. Grey founded Primordial, LLC, which produced
ZOOB, and currently serves as President of the Sound of Time, a
multimedia editing system. As an artist, Grey has exhibited
internationally and won the Golden Nica Award from Ars
Electronica. He has a long background in combining industrial
design, mechanical engineering, entertainment and education. He
orchestrates collaborative efforts between various educational
institutions, including Cal Tech, the Art Center College of
Design, and the Berkeley Interdisciplinary Design Institute.
Grey has served on the boards of Zero One, ATC, and Eyebeam

Atelier, among others.

Grey and Pfister join Roger Malina, Chair; Martin Anderson, Treasurer; Mark Resch, Secretary; Mina Bissell; Penelope Finnie; Lynn Hershman; Ed Payne; Sonya Rapoport; Beverly Reiser; Joel Slayton; and Stephen Wilson on the Leonardo/ISAST Governing Board.

SUNDAR SARUKKAI AND JULIO BERMUDEZ
SUNDAR SARUKKAI is a Fellow in the History and Philosophy of Science Unit, National Institute of Advanced Studies, Indian Institute of Science, Bangalore, India. He received his Ph.D. in Theoretical Particle Physics from Purdue University. Recipient of various fellowships, including the Homi Babha Fellowship and David Ross Fellowship, Sarukkai has been a visiting scholar at MIT and Stanford University. He authored the books *Translating the World: Science and Language* and the forthcoming *The Philosophy of Symmetry.* Sarukkai publishes and lectures worldwide in science and philosophy journals and conferences. Sarukkai currently serves as a consultant to a project on the relevance of Gandhian thought to contemporary India.

JULIO BERMòDEZ, hailing from Argentina, is an Associate Professor at the University of Utah College of Architecture and Planning. His research and creative work have focused on digital media and the application of architectural concepts to data environments. Bermœdez has received international recognition as a design expert on hybrid representations, methodologies, and technologies involving analog and digital systems. Of particular relevance is his invention of CyberPRINT, a virtual reality-based performing art project that brings together dance, choreography, music, engineering, medicine and architecture. This and other works have been widely published, exhibited and/or performed in the U.S. and elsewhere. Bermœdez is currently involved in several interdisciplinary projects dealing with information architecture applied to medicine, finance, process control and network monitoring.

Sarukkai and Bermœdez will serve on the Leonardo/ISAST International Advisory Board along with Beverly Reiser, Chair, USA; Mark Beam, Mexico; Annick Bureaud, France; Nic Collins, USA; Nisar Keshvani, Singapore; Christine Maxwell, France; Michael Naimark, USA; Michael Punt, UK; and Rejane Spitz, Brazil.

DOUGLAS A. VAKOCH
Starting his term on the *Leonardo* Editorial Board in 2004, DOUGLAS A. VAKOCH is the Director of Interstellar Message Composition at the SETI Institute, as well as the only social scientist employed by a SETI (Search for Extraterrestrial Intelligence) organization. Vakoch researches ways that different civilizations might create messages that could be transmitted across interstellar space, allowing communication between humans and extraterrestrials even without face-to-face contact. He is particularly interested in how we might compose reply messages that would begin to express the human experience.

_____

OLATS NEWS - JULY 2003

* IDEA online/International Directory of Electronic Arts:
http://nunc.com
* OLATS/Observatoire Leonardo des Arts et des Techno-Sciences:
http://www.olats.org

This month's OLATS News is a bit unusual for this summer issue.
Besides the symposium, "Visibility - Legibility of Space Art,"
which Leonardo/OLATS is co-organizing in collaboration with the
International Festival @rt Outsiders in Paris, we include
announcements and recommendations for books and a journal, which
we have not published but that we highly recommend.

VISIBILITY - LEGIBILITY OF SPACE ART. ART AND ZERO GRAVITY :
THE EXPERIENCE OF PARABOLIC FLIGHTS

(http://www.olats.org)
October 4th and 5th - Maison Europ□enne de la Photographie,
Paris. Curated by Annick Bureaud, this symposium is co-organized
by Leonardo/OLATS and the International Festival @rt Outsiders
(http://www.art-outsiders.com).

It will gather artists, theoreticians and scientists with a
knowledge in parabolic flights : Kitsou Dubois, Marcel.Li
Antunez-Roca, Takuro Osaka, Kodwo Eshun and Anjalika Sagar,
Vadim Fishkin, Flow Motion (Anna Piva and Edward George), Frank
Pietronigro, Nicola Triscott and Rob Lafrenais, Roger Malina,
Marko Peljhan, Alex Adriaansen, Mikhail Ryklin, Louise Wilson,
Thierry Pozzo and Denis Thierion.

ARTMEDIA VIII SYMPOSIUM PROCEEDINGS

The latest issue of the journal *Ligeia* is dedicated to the
proceedings of the International Symposium, "Artmedia VIII: From
Aesthetics of Communication to Net Art." Under the title "Art et
Multimedia", the French texts of the symposium, which was held
in Paris in December 2002, are being published, co-organized by
Annick Bureaud, Fred Forest and Mario Costa. All these texts, in
French, together with some of them in English, and all the
information related to the symposium, are available on-line on
the Leonardo/OLATS web site: http://www.olats.org/setF11.html

TECHNOETIC ARTS, A JOURNAL OF SPECULATIVE RESEARCH

Founded by Roy Ascott, this peer-reviewed journal, published by
Intellect
(http://www.intellectbooks.com/journals/technoetic/index.htm),
presents the cutting edge of ideas, projects and practices
arising from the confluence of art, science, technology and
consciousness research. It has a special interest in matters of
mind and the extension of the senses through technologies of
cognition and perception. It documents accounts of
transdisciplinary research, collaboration and innovation in the
design, theory and production of new systems and structures for
life in the 21st century, while inviting a re-evaluation of
older worldviews, esoteric knowledge and arcane cultural
practices. Artificial life, the promise of nanotechnology, the
ecology of mixed reality environments, the reach of telematic
media, and the effect generally of a post-biological culture on
human values and identity are issues central to the journal's

focus.

ROY ASCOTT, TELEMATIC EMBRACE: VISIONARY THEORIES OF ART,
TECHNOLOGY, AND CONSCIOUSNESS, EDITED AND WITH AN ESSAY BY
EDWARD SHANKEN, THE UNIVERSITY OF CALIFORNIA PRESS, 2003

We had been waiting for it, and here it is! A book with the
collected essays by Roy Ascott, from the late 1960s and his
approach to cybernetics, to today's consciousness research. And
even a bonus with the introductory essay by Edward Shanken.

```
 _____
|                    |
|                    |
|      CREDITS       |
|                    |
|_____|
```

Nisar Keshvani: LEA Editor-in-Chief
Michael Punt: LDR Editor-in-Chief
Patrick Lambelet: LEA Managing Editor
Beth Rainbow: Assistant Editor
Andre Ho: Web Concept and Design Consultant
Roger Malina: Leonardo Executive Editor
Stephen Wilson: Chair, Leonardo/ISAST Web Committee

Editorial Advisory Board:
Irina Aristarkhova, Roy Ascott, Michael Naimark, Craig Harris,
Julianne Pierce

Gallery Advisory Board:
Mark Amerika, Paul Brown, Choy Kok Kee, Steve Dietz, Fatima
Lasay, Kim Machan

fAf-LEA corresponding editors:
Ricardo Dal Farra, Elga Ferreira, Young Hae-Chang, Fatima
Lasay, Lee Weng Choy, Jose-Carlos Mariategui, Marcus Neusetter,
Elaine Ng and Marc Voge

```
 _____
|                    |
|        LEA         |
|  WORLD WIDE WEB    |
|      ACCESS        |
|_____|
```

The LEA World Wide Web site contains the LEA archives, including
all back issues, the LEA Gallery, the Profiles, Feature Articles,
Publications, Opportunities and Announcements. It is accessible
using the following URL: <http://mitpress2.mit.edu/LEA>

```
 _____
|        LEA         |
|   PUBLISHING       |
|   INFORMATION      |
|_____|
```

Editorial Address:
Leonardo Electronic Almanac

Studio 3a, 35 Place du Bourg-de-four
1204 Geneva, Switzerland

E-mail: <lea@mitpress.mit.edu>

_____

_____

< Ordering Information >

http://mitpress.mit.edu/catalog/item/default.asp?ttype=4&tid=27&
mode=p

Leonardo Electronic Almanac is free to Leonardo/ISAST members and
to subscribers to the journal Leonardo for the 2003 subscription
year. The rate for Non-Leonardo individual subscribers is $35.00,
and for Non-Leonardo institutional subscribers the rate is
$75.00. All subscriptions are entered for the calendar year only.

All orders must be prepaid by check (must be drawn against U.S.
bank in U.S. funds), money order, MasterCard, VISA, or American
Express. Where student subscription rates are available, a
verification of matriculant status is required.

Note: In order to place orders electronically, you must be using
a browser that is SSL-compliant. If you are unable to open the
ordering link listed above, then your browser does not support
the security features necessary to use this interface. Please use
the addresses below to submit your order. Address all orders and
inquiries to:

Circulation Department
MIT Press Journals
Five Cambridge Center
Cambridge, MA 02142-1407 USA
TEL: (617) 253-2889 (M-F, 9-5)
FAX: (617) 577-1545 (24 hours)

For questions contact:
journals-orders@mit.edu (subscriptions)

_____

```
    _____
  |                  |
  |   ADVERTISING    |
```

|_____|

Individuals and institutions interested in advertising in
Leonardo Electronic Almanac, either in the distributed text
version or on the World Wide Web site should contact
<journals-info@mit.edu> at MIT Press for details.

_____

< End of Leonardo Electronic Almanac 11 (07) >
_____