



# Consciousness

B U L L E T I N

FALL 1999

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*Greetings and welcome to the current issue of Consciousness Bulletin.* Consciousness Studies at The University of Arizona continues to offer a range of conferences, courses, and other opportunities for those interested in the interdisciplinary field of consciousness theory and research. I would like to highlight several of these activities which are described in more detail within the Bulletin:

We have recently completed the review of applications for the second round of our annual small grants program, and are pleased to announce the current grant recipients and their projects on page 4. Competition for the grants was very stiff this year, with many more qualified proposals than could be funded. Please note that the call for research proposals on page 4 refers to the third round (year 2000) of these small grants. Our goal in the grants program, generously supported by the Fetzer Institute, continues to be the encouragement of consciousness research and scholarship by both junior and senior investigators across a wide range of topics and institutional settings.

On pages 2 and 3, you will find the announcement and submission guidelines for the upcoming "Toward a Science of Consciousness, Tucson 2000" conference held April 15–20, and the annual meeting of the Society for the Anthropology of Consciousness, which will be held contiguously in Tucson on April 5–9. With plenary speaker scheduling already well underway, the "Tucson 2000" conference looks like it will be the best meeting yet in our biannual series. Mark your calendars now and give serious consideration to submitting an abstract of your current work to be considered for inclusion in the program. Within the pages of this issue of the Bulletin, you will also find announcements concerning other upcoming activities sponsored by Consciousness Studies. These include a new online course entitled *Consciousness at the Millennium*, as well as a second revised offering of the *Modern Science and the Mind* (MSM) online course. A summary of the first (1999) MSM course offering is provided for your review. Consciousness Studies is also co-sponsoring the "Cajal on Consciousness" conference held November 29–December 1, 1999 in Zaragoza, Spain, featuring an outstanding program of talks by some of the world's most distinguished scientists and scholars.

This issue of the Bulletin also provides an overview of the recent programmatic efforts that Consciousness Studies has taken to encourage research on the intersection of consciousness and emotion, authored by Lis Nielsen. The focus upon emotion and consciousness was motivated by our belief that this intersection provided many opportunities for potentially fertile future research, which we hoped to help stimulate through various meetings, online conferences, and summer institutes. The overview written by Lis should also give you a sense of the general format of programmatic efforts we would like to make in the future, focusing upon other promising topical areas. One such area concerns the development of first-person methodologies and their relation to third-person observation. Beginning on page 8, Dave Chalmers, one of the co-directors of Consciousness Studies, has provided us with a thoughtful essay on first-person methodologies.

As the millennium rapidly approaches, we are looking forward to another stimulating and productive year, interacting with our many friends and colleagues in consciousness studies throughout the world. Please join us in as many of our future activities as you are able.

Best wishes,

Alfred W. Kaszniak, Ph.D.

Director, Consciousness Studies  
Department of Psychology  
University of Arizona



# Toward a Science of Consciousness

*Sponsored by Consciousness Studies at  
the University of Arizona*

Representatives from psychology, neuroscience, cognitive science, philosophy, computer science, physics, mathematics, medicine, physiology, biochemistry, anthropology, art and other fields are invited to a fourth major interdisciplinary scientific conference on consciousness.

## Consciousness

Researchers in the sciences and humanities are approaching the problem of consciousness from many directions. Can there be a scientific theory of consciousness? If so, what form should this theory take?

This conference will continue the exploration of the last great frontier of science. In the tradition of the first three Tucson conferences, the meeting will transcend disciplinary boundaries. Participants will raise questions from areas throughout the sciences and humanities and seek answers wherever they may be found.

Become part of the debate by planning to attend "Toward a Science of Consciousness, Tucson 2000."

Abstracts are due October 15, 1999.

Conference abstracts will be published in a special issue of the *Journal of Consciousness Studies*, included in the registration fee, and available at the conference. Continuing Education Units (CEU) will be available for the conference and pre-conference workshops.

April 10–15, 2000

Tucson Convention Center  
Music Hall

Tucson, Arizona

## Topics include

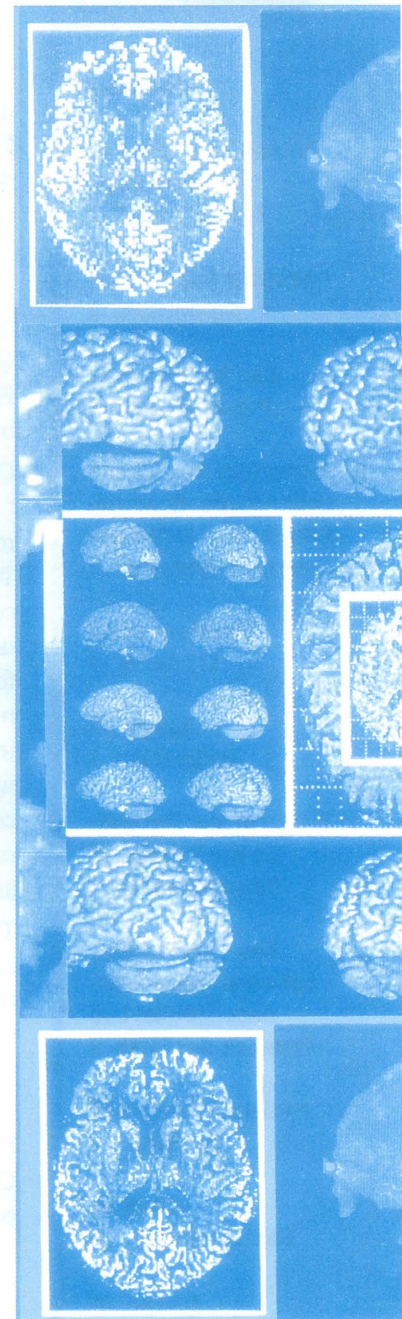
**Philosophy:** conceptual foundations, qualia, ontology, explanation, self, intentionality, mental causation, reality, free will

**Neuroscience:** neural correlates of consciousness, neuropsychology, vision, motor control, blindsight, anesthetic and psychoactive drugs, binding/integration

**Cognitive Science and Psychology:** implicit processes, attention, metacognition, memory, language, emotion, sleep, cognitive models, artificial intelligence, animal consciousness

**Physical and Biological Sciences:** quantum theory, space and time, evolution, biophysics, medicine, computational theory, quantum computation and information, life

**Phenomenology and Culture:** first-person methods, religion and contemplative studies, anthropology, transpersonal psychology, hypnosis, parapsychology, aesthetics

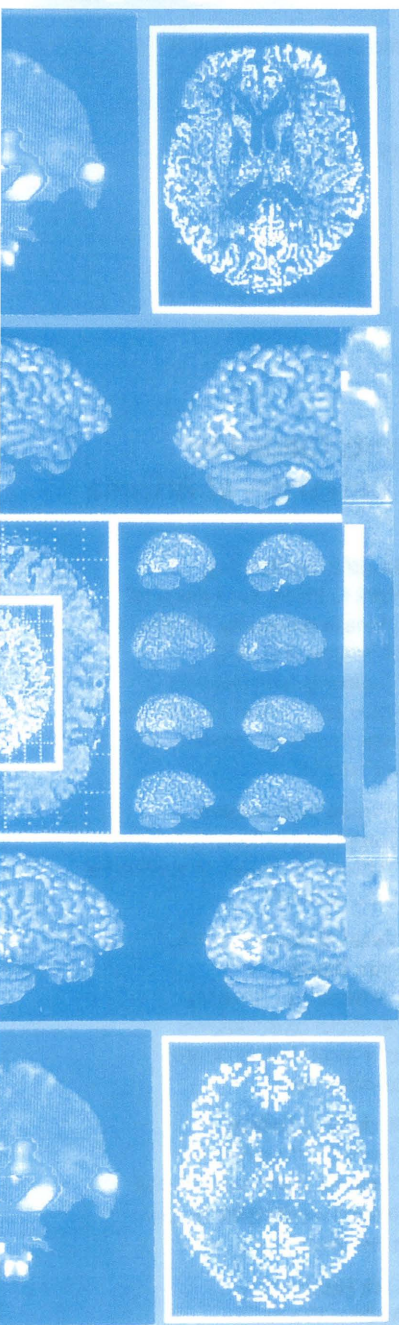


# Tucson



# n c e s c i o u s n e s s

CONFERENCE ANNOUNCEMENT AND CALL FOR PAPERS



## Scientific Program Committee

**David Chalmers**, Philosophy,  
University of Arizona

**Stuart Hameroff**, Anesthesiology and  
Psychology, University of Arizona

**Alfred Kaszniak**, Psychology, Neurol-  
ogy and Psychiatry, University of  
Arizona

**Christof Koch**, Computation and  
Neural Systems, California Institute  
of Technology

**Marilyn Schlitz**, Research Director,  
Institute of Noetic Sciences

**Alwyn Scott**, Mathematics,  
University of Arizona and Technical  
University of Denmark

**Petra Stoerig**, Psychology, University  
of Duesseldorf

**Keith Sutherland**, Publisher, *Journal  
of Consciousness Studies*

## Support has been provided by

Fetzer Institute

Institute of Noetic Sciences

## Abstract Submission Guidelines

"Toward a Science of Consciousness,  
Tucson 2000" April 10-15, 2000

Papers and posters are welcome from  
researchers in all disciplines engaged  
in the understanding of conscious-  
ness.

Abstracts (500 word maximum) are due  
October 15, 1999. If at all possible,  
please submit abstracts by e-mail to  
[tucson.abs@imprint.co.uk](mailto:tucson.abs@imprint.co.uk).

If this is not possible, send to:

Abstracts/Tucson Conference  
Keith Sutherland

Imprint Academic

P.O. Box 1

Thorverton, Exeter EX5 5YX  
England

Fax: +44 1392 841478

Include title, authors and affiliations.  
Designate presenting author (address/  
phone/fax/e-mail). You may be the  
presenting author for no more than  
one submission. Please indicate if  
preference of either oral presentation  
or poster and indicate numbers for  
primary and subsidiary subject classifi-  
cation according to the taxonomy on  
page 18. Authors will be notified of  
disposition by December 1. Late ab-  
stracts may be considered, but will  
receive a lower priority.

**The Society for the Anthropology  
of Consciousness (SAC)** will hold  
its annual meeting in Tucson from  
April 5-8, 2000. Participants in both  
SAC and Tucson 2000 can qualify for  
lower registration fees. Registration  
materials will be available in October.

# 2000



## Research in Consciousness Studies Third Round

Consciousness Studies at the University of Arizona is currently seeking research pre-proposals that address issues related to the understanding of consciousness.

Proposals are invited that stem from the following areas and will be judged on the basis of quality, originality, and relevance.

Interdisciplinary proposals are especially encouraged.

- 1) Philosophy
- 2) Neuroscience
- 3) Cognitive Science and Psychology
- 4) Physical and Biological Sciences
- 5) Phenomenology and Culture

# Call for Pre-Proposals

Examples of areas to be addressed would include, but not be limited to:

- the binding problem
- implicit cognition
- first-person methodologies
- the “hard problem” and the explanatory gap
- conscious and unconscious processes
- quantum approaches
- neural correlates of consciousness
- synesthesia
- computability vs. non-computability
- subjective time
- emergent and hierarchical systems
- cross-cultural approaches to mind

Pre-proposals are due November 1, 1999. A number of these will be selected to submit full proposals by February, 2000. Awards will be made in May, 2000.

Two types of awards are available: Research Grants and Visiting Research Fellowships.

### Research Grants

Projects in this category are generally conducted at the home institution of the researcher (although affiliation with an institution is not a requirement). Awards are available between \$10,000 and \$20,000 and typically run for one year.

### Visiting Research Fellowships

A limited number of awards are set aside to conduct research at the University of Arizona, possibly in conjunction with UA faculty and staff. A Visiting Research Fellowship typically lasts from two to six months and includes an award between \$5,000 and \$10,000.

### Pre-proposals should include:

- 1) Principal investigator(s) name and affiliation, address, phone number, e-mail, and a two-page CV.
- 2) Two page project description including project title, narrative, and a summary budget.

Indicate whether the application is for a Research Grant or a Visiting Research Fellowship.

It is preferred that submissions be sent by e-mail to

[center@u.arizona.edu](mailto:center@u.arizona.edu)

### Hard copies can be sent to:

Jim Laukes  
Consciousness Studies  
Department of Psychology  
University of Arizona  
Tucson, AZ 85721  
USA  
Phone: 520-626-9061

## Second Round Research Grants funded by Consciousness Studies, University of Arizona

**Ralph Adolphs, Hanna Damasio,  
Matthew Howard**  
(University of Iowa)  
*“Single-unit neurophysiology  
of emotional experience in the  
human brain”*

**Elizabeth Behrman**  
(Wichita State University)  
*“Simulation of a cytoskeletal  
quantum neural net”*

**Itzhak Fried, Christof Koch**  
(UCLA, California Institute of  
Technology)  
*“Recording single neurons in  
human cortex during binocular  
rivalry”*

**Cheryl Grills,  
Arletha Livingston**  
(Loyola Marymount University)  
*“Akan conceptualizations of  
consciousness”*

**Peter G. Grossenbacher**  
(National Institute of Mental  
Health)  
*“Deciphering synesthesia  
through structured interviews  
and psychophysics”*

**Edward S. Katkin**  
(SUNY at Stony Brook)  
*“The effects of viscerosensation on  
judgment and decision making:  
autonomic influences on uncon-  
scious processes”*

**Jason B. Mattingley,  
Mark C. Price, Yves Rossetti**  
(Monash University, University  
of Bergen, INSERM)  
*“Exploring consciousness in  
vision and action: interdiscipli-  
nary studies of normality and  
pathology”*

**William S. Robinson**  
(Iowa State University)  
*“Patterns as causes of qualitative  
consciousness”*

**Alexei V. Samsonovich,  
Lynn Nadel**  
(University of Arizona)  
*“Artificial consciousness  
as a metaphor for human  
consciousness”*

**Michael J. Spivey**  
(Cornell University)  
*“Implicit visual memory and  
imagery as revealed by eye  
movements”*

**Jack Tuszynski,  
Andrew Brown**  
(University of Alberta)  
*“Building blocks of  
consciousness”*

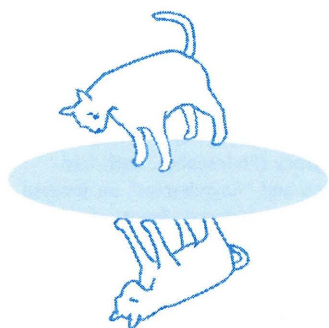




# Consciousness at the Millennium —

## Quantum Approaches to Understanding the Mind

*A Web course offered by  
Consciousness Studies,  
University of Arizona,  
September 27, 1999–  
January 14, 2000*



### Course Leaders

#### Stuart Hameroff M.D.

Professor, Departments of Anesthesiology and Psychology; Associate Director, Consciousness Studies, University of Arizona, Tucson, Arizona, USA

#### Paavo Pyllkanen Ph.D.

Professor, Department of Philosophy Director, Center for Consciousness Studies, University of Skovde, Skovde, Sweden

### Faculty

**Dick Bierman**, Physics, University of Amsterdam, University of Utrecht, Netherlands

**David Chalmers**, Philosophy, University of Arizona, USA

**Michael Conrad**, Computer Science, Wayne State University, USA

**Scott Hagan**, Physics, National Agricultural Research Center, Tsukuba, Japan

**Stuart Hameroff**, Anesthesiology and Psychology, University of Arizona, USA

**Stan Klein**, Vision Science, University of California, Berkeley, USA

**Paavo Pyllkanen**, Philosophy, University of Skovde, Sweden

**Alwyn Scott**, Mathematics, University of Arizona, USA, Danish Technical University, Denmark

**Henry Stapp**, Physics, University of California, Berkeley, USA

**Nicole Tedesco**, Consultant, Quantum-Mind moderator, Boston, USA

**Quentin Turchette**, Physics, National Institute of Standards and Technology, Boulder, USA

**Jack Tuszynski**, Physics, University of Alberta, Canada

**Fred Alan Wolf**, Physics, "Have brains, will travel," San Francisco, California, USA

### Overview

Enigmatic features of both quantum mechanics and consciousness have led to a number of proposals suggesting links between the two. Some have proposed quantum effects in the brain, while others have suggested a role for consciousness in the interpretation of quantum mechanics. The advent of quantum information technology (i.e. quantum computation, quantum cryptography, etc.) promises inevitable further connections. This 13 week Web course covers these issues.

### Themes/Lectures

#### Week 1

September 27–October 3, 1999

What is consciousness? What are the current, prevalent classical explanations? Can features of consciousness which resist these explanations (e.g. subjective experience, "qualia," binding, pre-conscious to conscious transitions, non-computability, free will, non-local anomalies, apparent backwards time referral) be more readily explained through quantum mechanisms?

**Lecturers:** Paavo Pyllkanen, Stuart Hameroff

**Commentators:** David Chalmers, Stanley Klein, Alwyn Scott

#### Week 2

October 4–10, 1999

Interpretations of quantum mechanics and the nature of reality: the measurement problem, Bohm's theory, Everett's theory, collapse interpretations, many-minds interpretations, Schrodinger's cat, Wigner's friend, Bell's theorem, observer effects, quantum gravity, quantum field theory. Does understanding consciousness depend on understanding the nature of reality?

**Lecturers:** Paavo Pyllkanen, Scott Hagan

**Commentators:** David Chalmers, Stuart Hameroff

#### Week 3

October 11–17, 1999

Causality and consciousness. How can thought influence action? Quantum mechanics can provide for the actual control of actions by thoughts, per se, in a way that is not reducible to matter alone. The details of this possible influence of mind on matter will be described.

**Lecturer:** Henry Stapp

**Commentators:** Paavo Pyllkanen, David Chalmers, Alwyn Scott



## ● Week 4

October 18–24, 1999

Quantum information technology and theory (quantum computation, quantum cryptography, quantum teleportation, liquid NMR quantum computing, counterfactual, Shor's algorithm, Grover's algorithm, reversibility of quantum computation, technological implementations—current status). Will quantum information technology cause a paradigm shift in modeling the mind?

**Lecturers:** Quentin Turchette

**Commentators:** Nicole Tedesco, Jack Tuszyński, Fred Alan Wolf

## ● Week 5

October 25–31, 1999

Potentially relevant quantum mechanisms in the brain — quantum entanglement, coherence, superposition, evanescent photons, tunneling, vacuum ground states, Bose-Einstein condensates — collapse including objective reduction decoherence. How could they occur in the “warm, noisy” brain?

**Lecturers:** Michael Conrad, Stuart Hameroff

**Commentators:** Scott Hagan, Jack Tuszyński, Alwyn Scott

## ● Week 6

November 1–7, 1999

Possible macroscopic and microscopic brain loci for quantum effects relevant to consciousness: thalamocortical loops, dendritic webs, membranes/membrane proteins, synapses, ion fluxes, microtubules, tubulins, hydrophobic pockets, pre-synaptic vesicular grids, water, glia, gap junctions.

**Lecturers:** Jack Tuszyński, Stuart Hameroff

**Commentators:** Scott Hagan, Michael Conrad

## ● Week 7

November 8–14, 1999

Bioenergetics, isolation and biological feasibility issues: thermal noise/decoherence, Frohlich mechanism, ordered water, actin gelation, protein conformational regulation, hydrophobic pockets, anesthetic effects.

**Lecturers:** Jack Tuszyński, Michael Conrad

**Commentators:** Alwyn Scott, Scott Hagan, Stuart Hameroff

## ● Week 8

November 15–21, 1999

Specific biological quantum consciousness models: Beck/Eccles, Bohm/Hiley,

Jibu/Yasue, Marshall, Penrose/Hameroff, Stapp, Vitiello, Walker, Wolf.

**Lecturers:** Paavo Pyllkanen, Stuart Hameroff

**Commentators:** Scott Hagan, Stanley Klein

## ● BREAK

November 22–29, 1999

## THANKSGIVING HOLIDAY

## ● Week 9

November 29–December 5, 1999

Philosophical approaches amenable to fundamental physics: idealism, monism, dualism, panexperientialism, pan-protopsyshism, Leibniz, Whitehead, Russell, Wheeler, Shimony, Eastern approaches.

**Lecturers:** Paavo Pyllkanen, Stuart Hameroff

**Commentators:** David Chalmers

## ● Week 10

December 6–12, 1999

Subjective experience, cognition, and quantum mechanisms: the “quantum paradigm” in altered states, psychiatric conditions, hallucinations, non-locality, parapsychology, artistic implementation, linguistics.

**Lecturers:** Stuart Hameroff, Dick Bierman

**Commentators:** Paavo Pyllkanen

## ● Week 11

December 13–19, 1999

Testable predictions/experimental approaches: non-locality, time anomalies, quantum correlations and coherence in biological systems, anesthetic effects, collapse/reduction.

**Lecturers:** Scott Hagan, Dick Bierman

**Commentators:** Jack Tuszyński, Stuart Hameroff

## ● BREAK

December 20, 1999 - January 2, 2000

## CHRISTMAS MILLENNIUM HOLIDAY

## ● Week 12

January 3–9, 2000

Quantum approaches to the living state, quantum vitalism, quantum effects in evolution, quantum genetics. Is life a quantum process?

**Lecturers:** Jack Tuszyński, Stuart Hameroff

**Commentators:** Alwyn Scott, Michael Conrad

## ● Week 13

January 10–16, 2000

The future of consciousness. If consciousness is indeed a quantum process and if quantum information technology becomes

commonplace, what possible scenarios (good and bad) for “artificial” or transplanted consciousness might develop? What are the ethical implications?

## REGISTRATION COST \$150

(see Registration Form on page 19)



## Quantum-mind

[quantum-mind@listserv.arizona.edu](mailto:quantum-mind@listserv.arizona.edu)

is an ongoing moderated e-mail discussion of quantum approaches to consciousness. Begun in June 1998, Quantum-mind currently has over 650 subscribers and active discussions on topics, which include:

- 1) Features of consciousness resistant to classical explanations
- 2) Interpretations of quantum mechanics and the nature of reality
- 3) Possible macroscopic and microscopic brain loci for quantum effects relevant to consciousness
- 4) Potentially relevant quantum mechanisms in the brain
- 5) Bioenergetics, quantum isolation, and biological feasibility
- 6) Philosophical approaches amenable to fundamental physics
- 7) Specific biological quantum consciousness models (e.g., Beck/Eccles, Bohm/Hiley, Jibu/Yasue, Marshall, Penrose/Hameroff, Stapp, Vitiello, Walker, Wolf)
- 8) Quantum computation/information technology and theory
- 9) Experimental approaches
- 10) Quantum approaches to the living state and evolution

Submissions are evaluated by moderators Gordon Globus (Psychiatry), Stuart Hameroff (Anesthesiology/Psychology), Donald Mender (Psychiatry), Nicole Tedesco (Computer Science), Saul-Paul Sirag (Physics) and Jan Pieter Verhey (Philosophy). Both free discussion and “Roundtables” on focused questions are employed. Skeptical criticism is welcome and appreciated.

### For information see:

<http://www.consciousness.arizona.edu/quantum-mind.html>

### Quantum-mind postings are archived at:

<http://listserv.arizona.edu/lsv/www/quantum-mind.html>

Quantum-mind is sponsored by Consciousness Studies at the University of Arizona and The Intuition Network.

To subscribe free to Quantum-mind, send an email message to:

[listserv@listserv.arizona.edu](mailto:listserv@listserv.arizona.edu)

The message should read:

subscribe quantum-mind yourfirstname  
yourlastname



Delivered by Tarcisio Della Senta, Director, Institute of Advanced Studies, United Nations University and Mari Jibu, Tokyo '99 Organizer, Notre Dame Seishin University at the conclusion of the conference, "Toward a Science of Consciousness: Fundamental Approaches."

# Tokyo '99 Declaration

*Good Afternoon,*

*Our fellow scientists and philosophers*

We speak to you, and on your behalf, in a spirit of hope.

In the coming years, studies of the brain and the mind will advance our understanding of consciousness.

In this quest of knowledge, the hope is for improving human well-being and the conditions of life on Earth.

Since early ages, with the power of their brain, human beings have developed knowledge and tools for doing both good and bad. Today, we have the intellectual, physical and financial resources to master the power of the brain itself, and to develop devices to touch the mind and even control or erase consciousness.

We wish to profess our hope that such a pursuit of knowledge serves peace and welfare.

But remember, twice in recent years we virtually failed to use brilliant scientific discoveries to serve such ends. The competition for mastering nuclear power has not made the world safer, nor has the analyses and synthesis of DNA relieved concerns raised by genetic engineering.

The question of ethics is before us once again, at the dawn of new discoveries about the brain and consciousness. This time, though, we are armed with the lessons of past failures, lessons that help us to meet the imperatives of hope.

Colleagues, let us take the first step.

Let us turn towards the brilliant scientific discoveries of the brain and consciousness, and seek a way towards peace and welfare, along which scientists and philosophers of the world may contribute to a good conscience of humanity and ethics.

Let us work for the wonders of science, instead of serving its dark powers.

Together, let us explore our brain and move towards a science of consciousness that will encourage arts, ethics and thinking.

This is, and will be, an endless quest, which will not be completed in a hundred days, nor in a thousand years, nor even perhaps in our lifetime on this planet.

But, let us begin.

Then, our fellow scientists and philosophers of the world: do not ask what you can establish with purely scientific interest only, but rather what you can do to serve human peace and welfare.

Let us erase the egocentric discipline-confined approach and join the collective effort to develop a science of consciousness. And let us develop it for fundamental discoveries and for serving the hope of human welfare, never warfare.

Will you join in such a historic effort towards hope?

*May the twenty-eighth, nineteen hundred-ninety-nine, at the United Nations University, in Tokyo.*



# First-person methods in the science of consciousness

**David Chalmers**  
 Department of  
 Philosophy,  
 University of  
 Arizona

Here are a few general thoughts about how I see the shape of a science of consciousness focusing on the issue of first-person methodology. At the end, I will make a few remarks about how this might apply to the study of emotion.

As I see it, the science of consciousness is about relating 'third-person data' — brain processes, behavior, environmental interaction, and the like — to 'first-person data' about conscious experience. I take it for granted that there are first-person data.

It's a manifest fact about our minds that there is something it is like to be us — that we have subjective experiences — and that these subjective experiences are quite different at different times. Our direct knowledge of subjective experiences stems from our first-person access to them. And subjective experiences are arguably the central data that we want a science of consciousness to explain.

I also take it that first-person data can't be expressed wholly in terms of third-person data about brain processes and the like. There may be a deep connection between the two — a correlation or even an identity — but if there is, the connection will emerge through a lot of investigation and can't be stipulated at the beginning of the day.

That's to say, no purely third-person description of brain processes and behavior will express precisely the data we want to explain, although it may play a central role in the explanation. So 'as data,' the first-person data are irreducible to third-person data.

**The job of a science of consciousness, then, is to connect first-person data to third-person data; perhaps to explain the former in terms of the latter, or at least to come up with systematic theoretical connections between the two.**

We ought at least to be able to come up with broad connecting principles, saying for example, that certain sorts of experiences go along with certain sorts



David Lapp





The orienting attitude of the Consciousness Studies initiative is that of Taking Conscious Experience Seriously, in all of its manifestations. These manifestations include, but are not necessarily limited to, perceptual and cognitive content and processes, affective experience, and spiritual experience.

Following the lead of William James, we advocate a radical empiricism in which all aspects of conscious and nonconscious mental phenomena are the fair game of investigation.

One aspect of taking conscious experience seriously involves an ongoing effort to improve approaches to its observation, description, and characterization. Another aspect involves the search for the multiple biologic, personal, social, and cultural correlates of conscious experience. Taking conscious experience seriously also implies the necessity of remaining open to the possibility that consciousness has causal efficacy. This includes considerations of whether changes in conscious experience mediate adaptive behaviors or health outcomes.

Over the past two years, Consciousness Studies has sponsored a series of events aimed at improving our understanding of how research on affective phenomena — in particular, conscious emotional experience — addresses these concerns. These events have been organized under the leadership of Dr. Alfred Kaszniak, whose own research targets the changes in emotional experience that occur as a result of aging and of neurologic disease and injury. These events have brought researchers and students from all areas of psychology (i.e., cognitive, clinical, developmental, social, and biological) together with investigators in philosophy, neuroscience, medicine, anthropology, and other disciplines. Their aim has been to broaden our understanding of how decades of research on emotional phenomenology and its relation to physiological, neural, cognitive, and behavioral aspects of emotion can inform the study of consciousness more broadly. In the planning of these events, there has been a concerted effort to include an evaluation of current methodologies

# Thematic

## Focus:

The

## Intersection

(between)

## Consciousness Studies

and

## Emotion

## Research

Lis Nielsen,

Department  
of  
Psychology,  
University  
of  
Arizona



Chalmers – continued from page 8

of processes in the brain (and/or vice versa), or certain sorts of experiences go along with certain sorts of information-processing (and/or vice versa), and so on. If we're successful with this, perhaps we'll eventually be able to formulate simple and universal laws that underlie these broad connecting principles. That would be what I've called a "fundamental theory" of consciousness. We're a long way from that now, but we can at least start to connect third-person data to first-person data at a broad level.

To do this, we need good methodologies for collecting the data and good languages and formalisms for expressing them. When it comes to third-person data, these methods are very well-developed.

Psychologists have developed sophisticated methods for studying behavior and neuro-scientists have developed an ever-expanding group of ingenious methods for getting at what is going on in the brain (e.g., EEG, brain imaging, single-cell studies, and many others). And there are multiple formalisms for expressing these data: plain language, neurophysiological classification, various sorts of images and diagrams, computational models, and more. It seems fair to say that on the third-person side of things, the central constraints of data gathering and expression stem from technological (and ethical) limitations rather than conceptual barriers.

When it comes to first-person data, things aren't nearly so well-developed. Here, methodologies for investigating the data are relatively thin on the ground and formalisms for expressing them are even thinner. When it comes to methodologies, there have been various ideas. The 19th century psychological introspectionists, 20th century philosophical phenomenologists,

and centuries of meditative studies in eastern thought have all developed sophisticated frameworks, but are all widely held to have serious limitations and none has been much integrated into contemporary science.



Mary Street

Contemporary scientists quite often rely on first-person data in central ways. For example, in psychophysics, first-person experience of various phenomena, such as illusions, seems to be the coin of the realm in capturing the data that need to be explained. The methodology here seems to be that of simple untutored introspection and verbal report. This is not bad for capturing gross and simple features of conscious experience (e.g., "does one see a pink splotch?"). Maybe such methods will take us a fair way, but eventually we will need more to investigate that manifold intricacies of conscious experience.

When it comes to formalisms for expressing first-person data, we are even worse off. Mostly, we rely on simple language — an experience of red or of a horizontal line, a feeling of happiness, a sharp pain. But this sort of language is obviously coarse and imprecise and usually relies on an interlocutor's experience of the same phenomena to carry any communicative content at

all. There have been a few attempts at developing more structured formalisms. For example, the quantitative methods used in measurement of sensation in psychophysics, or the structured phenomenal fields of Husserlian

phenomenologists, but nothing with remotely the precision and scope of formalisms in the third-person domain.

In my opinion, the development of more sophisticated methodologies for investigating first-person data and of formalisms for expressing them is the greatest challenge now facing a science of consciousness. **Only by developing such methodologies and formalisms will we be able to collect and express first-person data in such a way that it is on a par with third-person data, so that we can find truly systematic and detailed connections between the two.**

Fill Circle

When it comes to first-person methodologies, there are well-known obstacles — the lack of incorrigible access to our experience; the idea that introspecting an experience changes the experience; the impossibility of accessing all of our experience at once, and the consequent possibility of "grand illusions"; and more. I don't have much that's new to say about these. I think that could end up posing principled limitations, but none provide in-principle barriers to at least initial development of methods for investigating the first-person data in clear cases. I hope to see ideas from Western and Eastern philosophy and from contemporary and historical psychology integrated with a series of new ideas in coming years.

When it comes to first-person formalisms, there may be even greater obstacles. Can the content of experience be wholly captured in language or in any other formalism at all? Many have argued that at least some experiences are "ineffable". And if one has not had a given experience, can any description be meaningful to one? Here again, I

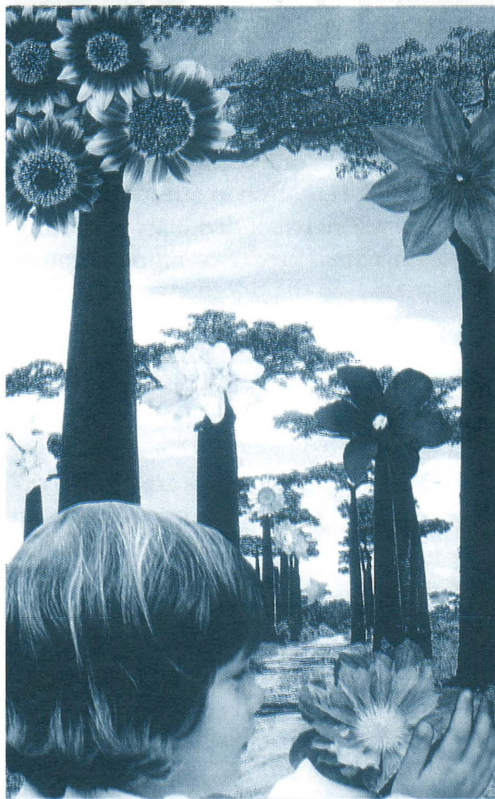






Nielsen – continued from page 9

used to study emotional experience. **Likewise, discussion has centered on what functions (adaptive or otherwise) emotional experience might play in integrating thought and behavior, and how aspects of, or changes in, emotional experience may relate to mental and physical health.**



Moya Devine Sweet Life — 'The brain mysterious, my conduit to the world'

This thematic focus has resulted in two online conferences, drawing hundreds of participants from around the globe; two focused Summer Institutes bringing together a small group of young investigators and established leaders in the field; plenary and concurrent sessions on emotion and consciousness at the Tucson III meeting; and an interdisciplinary international

conference, co-sponsored by the International School of Biocybernetics in Naples, Italy. Following are a few highlights from these events that serve to illustrate the development of efforts by Consciousness Studies at the University of Arizona to integrate the study of emotion with consciousness research.

#### What is Emotional Experience?

For both laypersons and many scientists, emotion is identified with feeling, and thus inextricably linked to consciousness. For some (e.g., Clore, 1994), emotions necessarily involve conscious feelings, and the important questions concern ways in which other conscious processes (e.g., appraisals about the personal significance of situations) affect emotional experience.

However, emotion is also thought to involve changes in physiology, expression, and cognition that may not be conscious.

Thus, emotional experience and nonconscious emotional processes can be conceptually and empirically distinguished. Various investigators have shown differential relationships between dimensions of self-reported emotional experience, expression, physiology, and action tendency. What is the range of possible dissociations of emotion components?

To what extent can the conscious experience of emotion be dissociated from the other emotion components?

Some of these conceptual and empirical issues were tackled in the first online conference "Emotion, Consciousness, and Cognitive Neuroscience" held in March 1998. Among those invited to participate in this online forum were Joe LeDoux, whose work on the role of the amygdala in mediating fear responses in the rat has been widely publicized, and Richard Lane, who has carried out PET studies on the neural correlates of attention to affective experience. During the conference, a clear dichotomy emerged in the discussion of the neural processes underpinning the conscious experience of emotion. The view held by LeDoux is that there may be one "consciousness system" to which emotional and other processing systems send their outputs. This view stands in sharp contrast to the view that distinct brain areas mediate the conscious aspects of emotion — the position held by Richard Lane, whose research suggests that the anterior cingulate plays this function.

Further relationships between the brain and emotional experience were explored in presentations at the "Tucson III: Toward a Science of Consciousness" meeting in May 1998. Here, Al Kaszniak presented the results of studies showing deficits in experienced emotional arousal in patients with circumscribed frontal lobe injury whose experience of emotional valence remains intact. Doug Watt described the overlaps between the brain mechanisms responsible for generating affective states and those mechanisms postulated by ERTAS theory (Newman, 1997a, 1997b) to be responsible for generating the global workspace of consciousness. Jaak Panksepp presented an animal model for the experience of joy and laughter, and described studies implicating the role the periaqueductal gray in generating affective states in both humans and animals.

These discussions of the neural and evolutionary origins of emotional experience raised important questions for future research. One theme that emerged from both the first online conference and the "Tucson III" sessions was the difficulty of distinguishing between conscious and unconscious aspects of emotion in the laboratory and the need for better measures of emotional experience. These unresolved issues motivated a desire to gather researchers in focused groups to tackle these issues more carefully and intensively.

The first of several events to attempt this integration was the Summer Institute on "Emotion, Consciousness, and Culture" held in 1998 with the generous sponsorship of the Fetzer Institute at their Seasons Retreat Center in Kalamazoo, Michigan. Senior and junior investigators of emotion along with a handful of graduate students met for several days of informal discussion.

The opening session of the institute began with a brief experiential exercise designed to elicit negative emotion via guided imagery, with attention to the visceral, somesthetic, and cognitive aspects of the experience. The ensuing discussion revolved around the question of whether emotional experience itself has components that are dissociable. An



idea that emerged from this discussion was that emotion is an umbrella term covering a number of phenomena that share a class similarity, derived perhaps from their relationship to particular neural circuits. In addition, similarities emerge in the phenomenal properties of emotion, for example, in the experience of 'being out of control.'

From the perspective of the neurosciences, the central problem becomes determining how emotional experience is represented in neural tissue. What neurobiologic methods (e.g., functional brain imaging, neuropsychological studies of patients with focal brain lesions, EEG studies of healthy persons, animal lesion or stimulation studies) are best suited to investigating the correlates of conscious emotional experience? How can we be sure we are accurately differentiating conscious from nonconscious aspects of emotion in the laboratory? What methods allow for such differentiation?

A worry was voiced that an even greater empirical problem remained — a problem rooted in the fact that in human experience emotion is a complex, multi-layer, constructive process. This makes it extremely problematic to take a reductive approach. For example, there are multiple control levels in emotional experience. One has cases of affect controlling affect and of affective competition. This kind of complexity may not be easily detected in the laboratory.

Cross-culturally, the experience of emotion is a ubiquitous component of the stream of consciousness, and emotional "qualia" appear to interact with other contents and processes of consciousness in complex ways. **Many scholars and scientists believe that no scientific or philosophical account of consciousness can be complete without an understanding of the role of emotion.** In an effort to advance such understanding, the workshop "Emotion, Qualia, and Consciousness" was held in Naples and on the island of Ischia, Italy in October 1998.

The workshop was sponsored by the International School of Biocybernetics of the Istituto Italiano per gli Studi Filosofici in Naples in collaboration with Consciousness Studies at the University of Arizona.

As presentations at the Ischia conference highlighted, due to difficulties inherent in rendering first person subjective experience measures amenable to scientific interpretation, our current understanding of the experiential component of emotion remains limited. While third person analysis often aims at identifying underlying causal relationships, first person inquiry aims to capture the qualitative feel of emotional phenomena.

Clearly these are two distinct sorts of information, and a complete science of emotion relies on both.

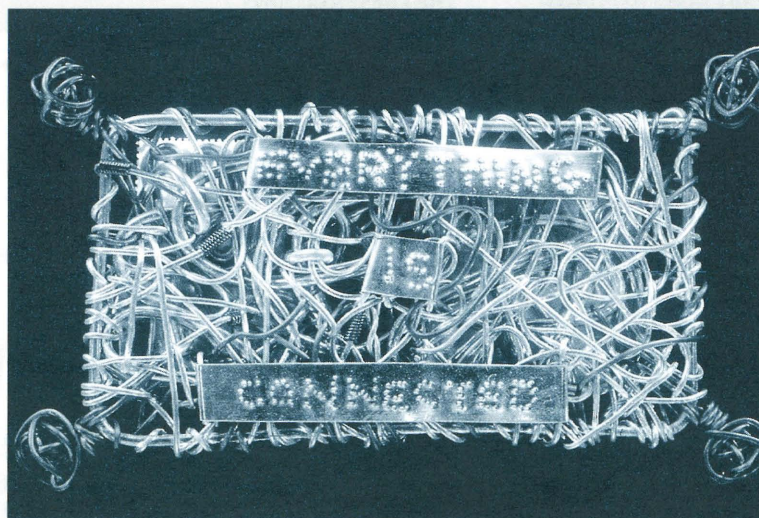
In February/March 1999, a second online conference "The Investigation of

Conscious Emotion: Combining First Person and Third Person Methodologies" was organized to discuss how this integration might most fruitfully be achieved. Researchers in a variety of disciplines have outlined strategies for integrating phenomenological data into studies of consciousness and for allowing findings at the phenomenological level to constrain approaches at other more objective levels of analysis. Thus, both phenomenologists, philosophers of consciousness, and empiricists and clinicians in the field of emotion research were invited to share their views on the best methods for first person observation and measurement. In two weeks of lively discussion, the strengths and weaknesses of current methodologies were debated, and new avenues for research were proposed. In addition, it was suggested that full acceptance of phenomenological data as a valid component to experimental studies might come through the consistent demonstration that emotional experience has an important functional role (e.g., in cognitive activity, social behavior, or mediating health outcomes). Such an approach will require that we continue to evaluate and improve our experiential measures, and that we develop a better understanding of the dimensions along which experiences can vary.

In both the laboratory and in therapy, as in numerous situations throughout the lifespan, the awareness of emotion and its role in solving tasks or shaping phenomenal experience is important for a variety of outcomes. Programs of intervention aimed at improving emotional awareness have been implemented in medical settings and schools with the aim of reducing somatic complaints not attributable to identifiable physiological causes, and of fostering self-efficacy, empathy, and social understanding.

These programs, like therapeutic methods that take an experiential focus, have met with considerable success. In an effort to bring together experiences from these diverse approaches with experiences in more traditional laboratory

*continued on page 18*



Frank Steil

*Everything is Connected*



**MODERN SCIENCE AND THE MIND** is a Web-based course that was presented during the spring semester of 1999 (mid-January to mid-May) by Consciousness Studies at the University of Arizona for a worldwide audience. In response to its enthusiastic reception, an improved version of this course will be offered again in the spring of 2000.

Specifically designed for the general public, **MSM** examines salient aspects of current physical, biological, cognitive, and social sciences to provide a sound basis for evaluating the role of science in consciousness studies. Participants are encouraged to appreciate the immense intricacy of real biological and mental phenomena, moving beyond sweeping theoretical formulations toward a balanced understanding of what science may be able to contribute to current discussions of the body, the brain, and the mind.

**MSM** is organized around fifteen presentations of approximately 3,000 words each, which are currently being rewritten for the spring of 2000 in a lively and reader-friendly style that avoids technical jargon. These presentations feature many links to related Web sites, enabling participants to gain a broad appreciation for the scope of current activities in modern consciousness science.

**MSM** will run for fifteen weeks, from January 17, 2000 through May 8, 2000, with a week off for the "Tucson 2000" conference. One presentation will be posted on the Web each Monday, together with independent contributions from a distinguished selection of commentators. Throughout the week, participants are encouraged to interact with the commentators, the course leader, and among themselves on topics related to the presentations.

#### COURSE LEADER

Alwyn Scott at [www.imm.dtu.dk/documents/users/acs\\_homepage.html](http://www.imm.dtu.dk/documents/users/acs_homepage.html) is a professor at both



the Department of Mathematics at the University of Arizona and the Department of Mathematical Modeling at the Technical University of Denmark. He is a founding editor of *Physica D: Nonlinear Phenomena* and the founding director of the Center for Nonlinear Studies at the Los Alamos National Laboratories. At the University of Arizona, he is a member of the Program in Applied Mathematics, the Neurosciences Program, and an associate director of Consciousness Studies.

#### THE PRESENTATIONS

**1) A MOST INTERESTING CENTURY:** As an introduction to the course, some significant aspects of 20th century science are described in lay language and placed into historical context. These include special and general relativity, atomic structure, quantum mechanics, atomic energy, solid state electronics, the digital computer, DNA coding, nonlinear science, behaviorism, cognitive science, and artificial intelligence.

**2) CYBERNETICS AND INFORMATION THEORY:** Basic concepts of negative feedback, control theory, information theory, and communication theory are presented in simple terms, leading to

an appreciation of Norbert Wiener's *cybernetics* and its applications to robotics as well as to the modeling of biological organisms.

#### 3) THE EMERGENCE AND DYNAMICS OF COHERENT STRUCTURES:

Positive feedback is qualitatively described and its relationship to the phenomenon of *emergence* in nonlinear systems is established through a selection of examples from physical chemistry, hydrodynamics, electrophysiology, nonlinear optics, biology, and planetary science. The ambiguous nature of *causality* in the presence of several positive feedback loops is examined.

**4) THE STREAMS OF TIME:** The elusive concept of time is considered from several perspectives, recognizing its distinctly different character at the lower (atomic and molecular) levels of scientific description, where energy is conserved and time is bidirectional, rather than at biological levels, where aging and death occur.

#### 5) SCHROEDINGER'S CAT AND ALL THAT:

The development of quantum theory during the 20th century is simply presented, noting Karl Popper's distinction between subjective and objective interpretations of quantum probabilities, and reviewing the fundamental reappraisals of John Bell. Topics to be discussed include: the subjective (Copenhagen) interpretation of a wave packet, wave-particle duality, hidden variables, wave packet collapse, the EPR experiment, Erwin Schroedinger's cat, the experiments of Alain Aspect, nonlocality, decoherence, and Niels Bohr's correspondence principle.

#### 6) THE GROWTH OF BIOLOGICAL FORM:

Having become somewhat familiar with modern physical science, attempts to understand biological morphogenesis are considered from the perspectives of both D'Arcy Thompson's energetics and Alan Turing's dynamic pattern generation. The relation of dynamic pattern formation to the nerve impulse are considered and implications for the course of evolution are discussed.

# MODERN SCIENCE AND THE MIND January 17— May 8, 2000



**7) IS A GENE SELFISH?** The connection between protein structures and DNA codes is described, introducing Walter Elsasser's concept of an *immense number* which is finite but so large that there can never be a list of all items. Upon appreciating the intricacy of the bacterium *Escherichia coli*, the concept of *genetic reductionism* is critically examined.

**8) THE LADDERS OF LIFE:** The early evolution of life on Earth is sketched, emphasizing the role of bacteria in exploring some of the immense number of possible protein structures. A general picture of a biological organism as a *nonlinear dynamic hierarchy* is presented from which the phenomenon of life appears to *hyper-emerge*, a new concept that will be discussed in detail.

**9) THE MULTIPLEX NEURON:** Moving on to the neural structure of a brain, the *threshold phenomenon* in nerve fibers is described, expanding the concept of *all-or-nothing propagation* of a nerve impulse and leading to possibilities of *dendritic logic* in a typical neuron. Implications for the intricacy of real neural interactions are explored, suggesting difficulties with conventional "neural network theory."

**10) THE HIERARCHICAL ORGANIZATION OF THE BRAIN:** Using a social metaphor, Donald Hebb's concept of *neural assemblies* is introduced which form functional entities of cognition at higher levels than that of the individual neuron, suggesting a nonlinear dynamic hierarchy in the brain. The importance of Erich Harth's "creative loop" for establishing a relationship between sensory experience and higher functions of the neocortex is emphasized.

**11) THE DIMENSIONS OF CREATIVITY:** Treating the brain as a nonlinear dynamic hierarchy, the number of dimensions of a *phase space* that is large enough to embrace the dynamics of creative brain activity is counted and shown to be immense. This implies that human cognitive activity cannot be reduced to the dynamics of individual neurons and their synapses.

**12) PATTERNS OF CULTURE:** Since the cognitive hierarchy of a real brain includes the social level, each human being represents both the highest level of biological organization

and an "atom" of human culture. Implications of this ethnologic perspective for studies of human consciousness are considered.

**13) SUBSTRATES OF CONSCIOUSNESS:** Various attempts to discover the locus of mind and understand its nature are reviewed, paying particular attention to current discussions among quantum mind proponents, advocates of parapsychology, and those following more traditional approaches stemming from electrophysiology. It is suggested that mind may be a hyper-emergent property of *both* the biological and the cognitive hierarchies.

**14) THE NATURE OF MIND:** Since science does not yet have a clear concept of what consciousness is, it seems prudent to search for it the broadest context that can be imagined. Thus the "three worlds" model of Karl Popper and John Eccles is presented and related to ideas formerly proposed by Plato and to the "four quadrants" of mind proposed by Ken Wilber.

**15) IMPLICATIONS FOR CONSCIOUSNESS RESEARCH IN THE 21st CENTURY:** In this final presentation, it is recognized that the hyper-immense intricacy of the human brain has implications for the future organization and conduct of research in the fields of philosophy, computer science, psychology, clinical and psychiatric medicine, biology, condensed matter physics, electrophysiology, ethnology, applied mathematics, esthetics, and ethics. Several such proposals for new century are presented and discussed.

#### ASSOCIATED READINGS

The presentations are related to the discussions in Alwyn Scott's *Stairway to the Mind*, which has recently been reprinted by Springer-Verlag (Copernicus). Those who are familiar with the language of mathematical physics will also be interested in reading *Nonlinear Science: Emergence and Dynamics of Coherent Structures*, which has recently been published by Oxford University Press. More information on these books is available at [www.imm.dtu.dk/documents/users/acs/homepage.html](http://www.imm.dtu.dk/documents/users/acs/homepage.html).

#### Commentators to **Modern Science and the Mind** will include:

**Rodney Cotterill** (Physics, Technical University of Denmark)

**Erik Fransen** (Computer Science, Royal Institute of Technology, Stockholm)

**Roy Frieden** (Optical Sciences, UA)

**Vittorio Gallese** (Neurophysiology, University of Parma)

**Cheryl Grills** (Psychology, Loyola Marymount University)

**Arun Holden** (Computational Biology, University of Leeds)

**Victor J. Hruby** (Chemistry, UA)

**Margaret Kidwell** (Biology, UA)

**Aaron King** (Mathematics, UA)

**Benny Lautrup** (Physics, Niels Bohr Institute)

**Marcel Neuts** (Systems Science, UA)

**John Pickering** (Psychology, University of Warwick)

**Mario Salerno** (Physics, University of Salerno)

**Charles T. Tart** (Psychology, Institute of Transpersonal Psychology)

**Jack Tuszinsky** (Physics, University of Alberta)

**Burton Voorhees** (Mathematics, Athabasca University)

**Art Winfree** (Biology, UA)

**Michael Winkelman** (Anthropology, Arizona State University)

**Ludmilla Yakushevich** (Mathematical Biology, Institute of Cell Biophysics, Pushchino, Russia)

#### REGISTRATION COST \$150

(see Registration Form on page 19)

#### MORE INFORMATION

To learn more about **MSM** and to keep abreast of organizational developments, visit the CCS Web site at [www.consciousness.arizona.edu/modernsci/main.html](http://www.consciousness.arizona.edu/modernsci/main.html)

## "OPEN SPACE" IN ELSINORE!

From August 3–7, 2000, all MSMers are invited to attend a meeting in Elsinore, Denmark (near Hamlet's castle) which will be organized in an "open space" format. Taking advantage of the observation that coffee breaks are usually the most important part of a scientific conference, this meeting will be motivated by and run by the participants who will choose the topics to be considered and the ways in which they are addressed. Circle these dates on your calendar and watch the MSM Web site for further information.



# International centennial conference to be held in Zaragoza, Spain commemorating the publication of

*"Textura del Sistema Nervioso del Hombre y los Vertebrados"* by Santiago Ramón y Cajal, 1899:

# "CAJAL ON CONSCIOUSNESS"

Monday, November 29–  
Wednesday, December 1, 1999

"Textura del Sistema Nervioso del Hombre y los Vertebrados," published in 1899 by Santiago Ramón y Cajal (Madrid, N. Moya: 1899-1904), is the masterpiece of Spanish science and perhaps the most influential work in the history of neuroscience. To commemorate the centennial anniversary of its publication, the host Aragonese institutions are re-editing the book and holding a public discussion on Cajal's seminal contributions to contemporary science. A dialogue with the most relevant figures of the international scientific community from the neurosciences as well as from other disciplines has been organized in collaboration with distinguished Spanish scientists. The topic chosen for the debate — the scientific approach to consciousness — is a leit motiv which underlies Cajal's own work and has become a focal point for interdisciplinary dialogue at the turn of the millennium. Undoubtedly, one of the perennial engines of scientific progress is the ambition to understand the nature of our own consciousness.

**OPENING SESSION** Monday 11/29/99  
David Chalmers (University of Arizona)

Ilya Prigogine (Université Libre de Bruxelles)

**MIND AND MATTER** Tuesday 11/30/99  
Murray Gell-Mann (Santa Fe Institute)

Harold J. Morowitz (Krasnow Institute, George Mason University)

**THE EVOLUTIONARY PROCESS**  
Lynn Margulis (University of Massachusetts)

François Jacob (Institut Pasteur)

**THE NATURE OF INTELLIGENCE**  
Terrence Sejnowski (Salk Institute for Biological Studies)

Lotfi A. Zadeh (University of California at Berkeley)

Roger Penrose (University of Oxford)

**ROUNDTABLE:** Natural Sciences and Consciousness: Filling in a Historical Gap?

**THE "DOCTRINE OF THE NEURON" REVISITED** Wednesday 12/1/99  
Jean-Pierre Changeux (Institut Pasteur)

Eric Kandel (Columbia University)

**INFORMATION PROCESSING AND BRAIN ARCHITECTURE**  
Torsten Wiesel (Rockefeller University)

Wolf Singer (Max Planck Institute for Brain Research)

Petra Stoerig (University of Dusseldorf)

**THE EMERGENCE OF CONSCIOUSNESS**  
Christof Koch (California Institute of Technology)

Stuart Hameroff (Consciousness Studies, University of Arizona)

Gerald Edelman (The Neurosciences Institute)

**ROUND TABLE:** Envisioning Future Breakthroughs

**CLOSING ADDRESS**  
Floyd E. Bloom (Scripps Research Institute, Editor of *Science*)

# CONSCIOUSNESS"

**CO-CHAIRS:** Constantino Sotelo, Federico Mayor Zaragoza, Alberto Portera

## SCIENTIFIC SECRETARIAT

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## ORGANIZING INSTITUTIONS

Diputacion General de Aragon  
Universidad de Zaragoza  
sponsored by IBERCAJA and CAI  
with the scientific collaboration of the Instituto Ramón y Cajal (Madrid) and Consciousness Studies (University of Arizona)

## REGISTRATION AND GENERAL INFORMATION

Limited assistance (by order of registration); special fee for Ph.D. students; social program for accompanying persons. Contact:

Technical Secretariat: DI&CO  
Paseo Sagasta 19, enl. dcha.  
Zaragoza 50008, Spain

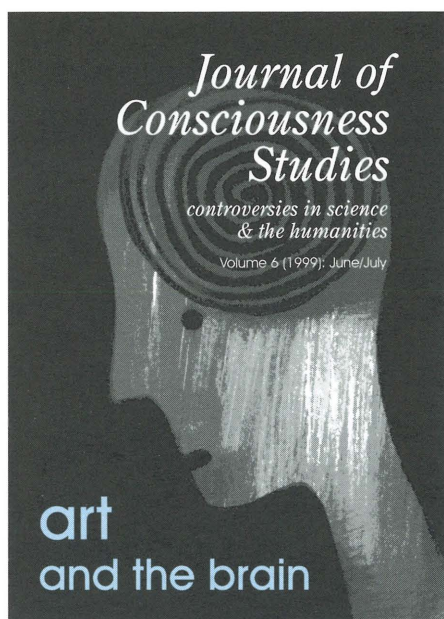
Tel. (34) 976 211 748 or 976 229 952.

Fax (34) 976 212 959

E-mail: [dico@dico.es](mailto:dico@dico.es)

Web: <http://cajal.unizar.es>





Never before has such a wide range of multidisciplinary expertise been brought to bear upon the central and most perplexing question of the human condition. **E.J. Lowe**

We cannot understand consciousness without tackling the self — and this book tackles it head-on. **Susan Blackmore**

In both its breadth and depth, *MODELS OF THE SELF* is outstanding testimony to the success of cognitive science in unravelling the conundrum of personhood. **Guy Claxton**

The book is fully edited, which is a rare feature in multi-authored works. It will be widely read by philosophers and researchers in neuroscience and psychology. **Marc Jeannerod**

The contributors come from many backgrounds, ranging from eastern mysticism to robotics. The commentators have fascinating things to say about the self, but there is no pretence that the problem is solved. As Galen Strawson says at the end, 'the result is a festival of misunderstanding, but misunderstanding is one of the great engines of progress.' **Chris Frith**

The breadth of coverage of its various articles is enormously useful to pull the reader away from his/her habitual assumptions and to peek into alternatives. **Francisco J. Varela**

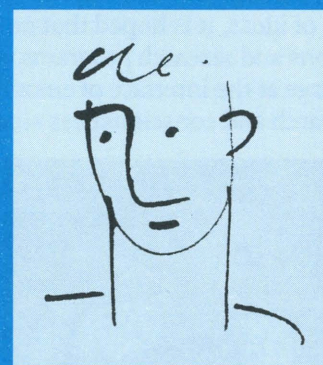
544 pp., 0 907845 40 1 (hardcover): \$38.95. Details: <http://www.imprint.co.uk/books>

In stock at [amazon.com](http://amazon.com) & [bookshop.blackwell.co.uk](http://bookshop.blackwell.co.uk) or special order at your bookstore

### MODELS OF THE SELF

A fast paced yet savvy set of readings on the thorny problem of the self. It is a must read. **Michael S. Gazzaniga**

## Models of THE SELF



Edited by Shaun Gallagher and Jonathan Shear

### THE VIEW FROM WITHIN

The study of conscious experience has failed to match developments in PET, fMRI and other third-person methodologies. If anything, the standard approaches to examining the 'view from within' involve little more than cataloguing its readily accessible components. Thus the study of *lived subjective experience* is still at the level of Aristotelian science.

Drawing on a wide range of approaches — from phenomenology to meditation — *THE VIEW FROM WITHIN* examines the possibility of a disciplined approach to the study of conscious experience. The focus is on the practical issues involved.

This is an important collection addressing the greatest challenge now facing a science of consciousness. Such a science must connect third-person data about brain and behavior with first-person data about conscious experience. But how do we gather the first-person data, and how can we represent it? This book explores sophisticated ideas from a variety of traditions. **David Chalmers**

Especially valuable is the editors' introduction, which provides a useful guide to the methodology of first-person accounts, and the articles that build bridges to cognitive science, psychiatry, and the scientific study of meditation techniques. **Evan Thompson**

*THE VIEW FROM WITHIN* is a major statement of the need to include first-person accounts . . . it will surely become one of the standard references in the field. **Ken Wilber**

320 pp., 0 907845 25 8 (paperback): \$25. Details: <http://www.imprint.co.uk/books>

In stock at [amazon.com](http://amazon.com) & [bookshop.blackwell.co.uk](http://bookshop.blackwell.co.uk) or special order at your bookstore

### Forthcoming:

**Benjamin Libet et al. (ed.)**, *The Volitional Brain: Towards a Neuroscience of Free Will*, September, \$32.95

**Rafael Núñez & Walter Freeman (ed.)**, *Reclaiming Cognition: the primacy of action, intention and emotion*, December, \$32.95


Full details and secure ordering on <http://www.imprint.co.uk/books>

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Nielsen – continued from page 13

including commonalities and differences in approaches to the assessment and training of emotional awareness over the life-span, applications in medical and therapeutic settings, the relationship between emotional awareness and problem solving ability, and the refinement of our models of the neural and information-processing mechanisms that underlie these capacities. Participants left with a renewed sense of the importance of refining their measures and integrating experiences from the other represented domains. The atmosphere of interdisciplinary collaboration fostered by each of these events has been viewed by the Consciousness Studies effort as essential to continued development of the field. By facilitating connections across disciplines and a cross-fertilization of ideas, it is hoped that new visions and research programs will emerge at the interface of emotion research and consciousness studies. 



Sister Shimotsuma *Human Condition*

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- Newman, J. (1997b). Putting the puzzle together, Part II: Towards a general theory of the neural correlates of consciousness. *Journal of Consciousness Studies*, 4, 2, 100-21.

## Consciousness Studies

See Abstract Submission Guidelines for the Tucson 2000 conference, page 3

## Taxonomy

- |   |   |
|---|---|
| 01.00 Philosophy  | 03.17 Theory of mind                          |
| 01.01 The concept of consciousness                      | 03.18 Intelligence and creativity             |
| 01.02 Ontology of consciousness                         | 03.19 Miscellaneous                           |
| 01.03 Knowing what it's like and the knowledge argument | 04.00 Physical and Biological Sciences        |
| 01.04 Qualia  | 04.01 Quantum theory                          |
| 01.05 Machine consciousness                             | 04.02 Space and time                          |
| 01.06 The function of consciousness                     | 04.03 Integrative models                      |
| 01.07 The "hard problem" and the explanatory gap        | 04.04 Emergent and hierarchical systems       |
| 01.08 Higher-order thought                              | 04.05 Nonlinear dynamics                      |
| 01.09 Epistemology and philosophy of science            | 04.06 Logic and computational theory          |
| 01.10 Personal identity and the self                    | 04.07 Bioelectromagnetics/resonance effects   |
| 01.11 Free will and agency                              | 04.08 Biophysics and living processes         |
| 01.12 Intentionality and representation                 | 04.09 Evolution of consciousness              |
| 01.13 Miscellaneous                                     | 04.10 Medicine and healing                    |
| 02.00 Neuroscience                                      | 04.11 Miscellaneous                           |
| 02.01 Neural correlates of consciousness (general)      | 05.00 Experiential and anomalous approaches   |
| 02.02 Vision  | 05.01 Phenomenology                           |
| 02.03 Other sensory modalities                          | 05.02 Meditation, contemplation & mysticism   |
| 02.04 Motor control                                     | 05.03 Hypnosis                                |
| 02.05 Memory and learning                               | 05.04 Biofeedback                             |
| 02.06 Neuropsychology and neuropathology                | 05.05 Other altered states of consciousness   |
| 02.07 Anesthesia  | 05.05 Transpersonal and humanistic psychology |
| 02.08 Cellular and sub-neural processes                 | 05.07 Psychoanalysis and psychotherapy        |
| 02.09 Quantum neurodynamics                             | 05.08 Lucid dreaming                          |
| 02.10 Pharmacology                                      | 05.09 Out-of-body experiences                 |
| 02.11 The binding problem                               | 05.10 Parapsychology                          |
| 02.12 Language  | 05.11 Miscellaneous                           |
| 02.13 Emotion   | 06.00 Culture and Humanities                  |
| 02.14 Sleep and waking                                  | 06.01 Literature, and hermeneutics            |
| 02.15 Specific brain areas                              | 06.02 Art                                     |
| 02.16 Miscellaneous                                     | 06.03 Music                                   |
| 03.00 Cognitive Science & Psychology                    | 06.04 Religion                                |
| 03.01 Attention   | 06.05 History                                 |
| 03.02 Vision  | 06.06 Aesthetics                              |
| 03.03 Other sensory modalities                          | 06.07 Mythology                               |
| 03.04 Memory and learning                               | 06.08 Sociology                               |
| 03.05 Emotion   | 06.09 Anthropology                            |
| 03.06 Language  | 06.10 Information technology                  |
| 03.07 Mental imagery                                    | 06.11 Ethics and legal studies                |
| 03.08 Implicit and explicit processes                   | 06.12 Education                               |
| 03.09 Unconscious/conscious processes                   | 06.13 Organizational studies                  |
| 03.10 Sleep and dreaming                                | 06.14 Miscellaneous                           |
| 03.11 Cognitive development                             |   |
| 03.12 Artificial intelligence & robotics                |   |
| 03.13 Neural networks and connectionism                 |   |
| 03.14 Cognitive architectures                           |   |
| 03.15 Ethology  |   |
| 03.16 Task performance and decision making              |   |



**Society for Neuroscience Satellite Symposium, Miami Beach Convention Center**

Saturday October 23, 1999  
1:00–5:00 p.m.

Sponsored by Consciousness Studies at the University of Arizona

**"Cajal on Consciousness"**

The Spanish neuroanatomist Santiago Ramon-y-Cajal discovered the brain was comprised of discrete neurons and glia. Today, the problem of consciousness is studied by many disciplines and is approached from different levels of brain organization within the neurosciences.

**Session 1, 1:00–2:45 p.m.**

Levels of brain organization contributing to consciousness

**Session 2, 3:15–5:00 p.m.**

The Big Picture: How does consciousness emerge from the various levels? Speakers to be announced.

**Consciousness Studies at the University of Arizona**

Alfred Kaszniak, Director  
David Chalmers, Associate Director  
Stuart Hameroff, Associate Director  
Jim Laukes, Associate Director  
Alwyn Scott, Associate Director

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