

## Plenary Program PL1 - PL13

### Tuesday June 6, 2017 Aventine Ballroom

PL1 2:00 to 4:10 pm

#### **CAN MACHINES BE CONSCIOUS?**

**Sir Roger Penrose, Oxford**, ‘How can Consciousness Arise Within the Laws of Physics?’  
**Joscha Bach**, Harvard, ‘Consciousness as a Memory of Coordinating Attention: The Conductor Model of Consciousness’  
**Hartmut Neven**, Google, Quantum AI, ‘Possible Roles of Quantum Effects and Subjective Experience in Artificial Intelligence’

### Wednesday, June 7, 2017

PL2 8:30 to 10:40 am

#### **LANGUAGE AND CONSCIOUSNESS**

**Thomas Bever**, U Arizona, ‘Three Aspects of (Un)conscious Processing in Language and its Normal Use’  
**Michael J Spivey**, UC Merced, ‘Language, Consciousness and Embodied Cognition’  
**Noam Chomsky**, MIT, ‘Language and Unconscious Mental Acts’

PL3 11:10 am to 12:30 pm

#### **BIOPHYSICS 1 - MEMORY, SPIN AND ANESTHESIA**

**Matthew Fisher**, UC Santa Barbara, ‘Are We Quantum Computers, or Merely Clever Robots?’  
**Travis Craddock**, Nova Southeastern U, ‘A Unitary Mechanism of Anesthesia?: Altering Collective Oscillations in Microtubules’

PL4 2:00 to 4:10 pm

#### **NON-INVASIVE BRAIN STIMULATION**

**Marom Bikson**, CCNY/CUNY, ‘Non-Invasive Brain Stimulation Devices to Change Thought and Behavior’  
**John Allen**, Arizona, ‘Transcranial Ultrasound, Mood, and Resting State Network Connectivity’  
**Marvin Berman**, VielLight, ‘Integrating Noninvasive Photobiomodulation and Neuromodulation’  
**Michael Rohan**, Harvard, ‘The Effects of Low Field Magnetic Stimulation on Mood and Brain Function’

### Thursday, June 8, 2017

PL5 8:30 to 10:40am

#### **PHYSICS, COSMOLOGY AND CONSCIOUSNESS**

**Ivette Fuentes**, University of Vienna, ‘Gravity in the Quantum Lab’  
**Brian Keating**, UCSD, ‘Conscious Cosmos’  
**James Tagg**, Cengine, Penrose Institute, ‘Are Human Beings Computers?’

PL6 11:10 am to 12:30 pm

#### **MUSIC AND THE BRAIN**

**Elaine Chew**, Queen Mary University London, ‘Mind over Music Perception’  
**Scott Makeig**, UCSD, ‘Mind Over Consciousness?’

PL7 2:00 to 4:10 pm

#### **NEUROSCIENCE AND CONSCIOUSNESS 1**

**Stephen Grossberg**, Boston U, ‘The Varieties of Brain Resonances and the Conscious Experiences They Support’  
**Georg Northoff**, U Ottawa, ‘Temporo-Spatial Theory of Consciousness’  
**Philip Low**, NeuroVigil Inc., ‘From Sleeping Finches to Stephen Hawking: Harnessing the Brain’s Whispers’

### Friday, June 9, 2017

PL8 8:30 to 10:40am

#### **NEUROSCIENCE AND CONSCIOUSNESS 2 - ANOMALIES**

**Daniel P. Sheehan**, U San Diego, ‘It’s About Time: Experiments in Consciousness and Retro-causation’  
**Peter Fenwick**, UC London, ‘A Meditation Teacher Who Can ‘Transmit’ Subjective Light/Energy’  
**Lakshmi S. Chawla**, George Washington U, ‘End-of-Life Brain Activity’

PL9 11:10 am to 12:30 pm

#### **BIOPHYSICS 2 - MEMRISTORS IN THE BRAIN?**

**Leon Chua**, UCSF, ‘Brains are Made of Memristors’  
**Jack A. Tuszynski**, U Alberta, ‘Microtubules as Subcellular Memristors’

PL10 2:00 to 4:10 pm

#### **NEUROSCIENCE AND CONSCIOUSNESS 3**

**Gentry Patrick**, UCSD, ‘Destruction as a Means of Remodeling: The Many Roles of Ubiquitin at the Synapse’  
**VS Ramachandran**, UCSD, ‘Embodied Brains and Disembodied Minds’  
**Charles F. Stevens**, Salk Institute, UCSD, ‘The Evolutionary Brain Mechanisms That Underlie Consciousness’

#### **Soterix Medical**

Transcranial Electrical Stimulation  
**Abhishek Datta**

#### **Roger Penrose Institute**

Creativity Inspiration/Creativity Competition  
**James Tagg**, **Erik Viirre**

#### **Mclean Hospital, Harvard Medical School**

Low Field Magnetic Stimulation  
**Michael Rohan**

#### **Arthur C. Clarke Center at UCSD**

Assembly  
**Sheldon Brown**

#### **University of Arizona Center for Consciousness Studies**

Transcranial ultrasound (‘TUS’) program  
**Chris Chan**, **Betsy Bigbee**, **Stuart Hameroff**, **Jay Sanguinetti**

#### **National Institute of Material Science, Tsukuba, Japan**

Visualizing microtubule information processing  
**Anirban Bandyopadhyay**

#### **University of Alberta**

Unfolding misfolded proteins to treat neurodegenerative disease  
**Jack Tuszynski**

#### **Geo-Pro-Ton, Slovenia**

‘Avatar’ Cognitive Training and Quantum Zeno Effect  
**Rado and Niko Gorjup**

## Wellness – Health

#### **The Chopra Center**

You Are The Universe - Wellness Space  
**Daily 7:00 - 8:00 am**

#### **Mark Valladares, TennisCentric**

Tennis Courts

#### **Daily 6:30-7:30 am and 4-5 pm**

#### **Beryl Bender Birch, Yoga and Meditation**

Social Events - badges required

### Tuesday, June 6, 2017 – 7:00 to 10:00 pm

#### **Opening Reception**

### Wednesday, June 7, 2017 – 9:00 – 11:00 pm

#### **Club Consciousness**

‘QUALIATIK’, ‘Dorian Electra and the Electrodes’

### Thursday, June 8, 2017 – 6:00 to 10:00 pm

#### **Conference Banquet\*\***

Vicino

Advance registration required \$75\* before May 25

*Elaine Chew, Queen Mary University of London, Piano*

### Friday, June 9, 2017 – 10:00 pm to midnight

#### **Club Consciousness**

*Elaine Chew, Queen Mary University of London*

*Scott Makeig - Brain Music Concert*

‘QUALIATIK’, ‘Dorian Electra and the Electrodes’

### Saturday, June 10, 2017

8:00 pm to ????

#### **Poetry Slam, Talent Show, Finals: Creativity Competition**

#### **‘End-of-Consciousness’ Party**

## Barcino

#### **Vicino Garden**


#### **Vicino**

#### **Vicino**

#### **Aventine**


#### **Vicino**

www.consciousness.arizona.edu

 THE UNIVERSITY OF ARIZONA  
Center for  
Consciousness Studies

THE SCIENCE OF  
**CONSCIOUSNESS**

June 5-10, 2017 | Hyatt Regency La Jolla  
San Diego, California



## Corrections and Updates to Abstract Book June 1, 2017

---

### 2017 TSC PLENARY

**Roger Penrose – Noam Chomsky – Deepak Chopra – Leon Chua  
Peter Fenwick – Lakshmi Chawla – Anirban Bandyopadhyay  
Iapei Dai – Joscha Bach – Harmut Neven – Vs Ramachandran  
Thomas Bever – Michael Spivey – Matthew Fisher – Travis Craddock  
Marom Bikson – John Allen – Marvin Berman – Michael Rohan  
Ivette Fuentes – Brian Keating – Jack Tuszynski – Gentry Patrick  
Charles Stevens – James Tagg – Elaine Chew - Scott Makeig  
Stephen Grossberg – Georg Northoff – Philip Low  
Daniel Sheehan – Erik Viirre – Xu Yinglin – Bruce Damer  
Alysson Muotri – Stuart Hameroff**

*“To have a glimpse of what consciousness is would be  
the scientific achievement before which all others would pale.”*

**William James**

‘The Science of Consciousness’ (‘TSC’) is an interdisciplinary conference on all aspects of the nature of conscious experience, awareness, feelings and existence. How does the brain produce consciousness? Is consciousness intrinsic to the universe, or an epiphenomenal illusion? How can consciousness causally affect brain processes? What are the best empirical theories? Do we have free will? How did life and consciousness originate and evolve? What are the origins of moral and aesthetic values? How can we improve mental, physical and cognitive function? Can consciousness persist after bodily death, e.g. through ‘uploading’ to machines, or via mental processes tied to the natural world?

Informal, intensive and interdisciplinary in a fun environment, the 24th annual TSC conference will consist of Plenary Sessions, Pre-Plenary Workshops, Evening Concurrent Talk and Poster sessions, Technology and Art Exhibits, Social Events and Entertainment.

### 2017 TSC SAN DIEGO

**Sponsored by**  
The Center for Consciousness Studies, The University of Arizona  
‘TSC’ ‘The Science of Consciousness’ Conference Series - since 1994  
The Center for Consciousness Science, The University of Michigan  
Quantum Gravity Research, Los Angeles  
Alvin J. Clark Foundation  
The Roger Penrose Institute, La Jolla, California  
The Bhaumik Institute of Theoretical Physics at UCLA (Mani Bhaumik Foundation)  
The Arthur C. Clarke Center for Human Imagination, UCSD  
Dayalbagh Educational Institute, Agra, India

**Conference Program Committee**  
Stuart Hameroff (Chair),  
Abi Behar-Montefiore, Betsy Bigbee, James Tagg, Erik Viirre, Jay Sanguinetti, Paavo Pylkkanen

## Saturday, June 10, 2017

PL11 9:00 to 11:10 am

### **VIBRATIONS, RESONANCE AND CONSCIOUSNESS**

**Anirban Bandyopadhyay**, NIMS, Tsukuba, ‘Vibrational Frequencies of Biomaterials are the Key to Integration of Information’

**Jiawei Dai**, South Central University, China, ‘Biophotonic Activities and Transmission in Relation to Consciousness’

**Erik Viirre**, UCSD, ‘Auditory Vibrations and Frequencies: Sounds in Your Head’

PL12 11:40 am to 1:00 pm

### **EASTERN PHILOSOPHY**

**Xu Yingjin**, Fudan University, China, ‘Contemporary Theories of Consciousness and Nishida’s notion of ‘Basho’’

**Deepak Chopra**, Chopra Foundation, ‘Mind, Body, and Universe as Human Constructs’

PL13 2:30 to 4:40 pm

### **ORIGIN AND EVOLUTION OF LIFE AND CONSCIOUSNESS**

**Bruce Damer**, UC Santa Cruz, ‘The Origin of Life and Consciousness’

**Alysson R. Muotri**, UCSD, ‘Cerebral Organoids for Neurodevelopmental and Evolutionary Studies

**Stuart Hameroff**, U Arizona, ‘The ‘Quantum Pleasure Principle’ - Did Life Evolve to Feel Good?’

**Pre-Plenary Workshops** (Included in conference registration)

## Monday Morning Workshops

**June 5, 2017 – 9:00 am to 1:00 pm**

- Integrated DEI East-West Forum 1 (Dayalbagh Educational Institute, Agra, India) Aventine
- Artificial Intelligence and Machine Consciousness (Tagg, Bach, Neven, Penrose, Rimmel, Verschure) Syros
- Tenniscentric (Valladares) Tennis Courts
- Yoga and Meditation (Birch) Vicino Garden

## Monday Afternoon Workshops

**June 5, 2017 – 2:00 pm to 6:00 pm**

- Integrated DEI East-West Forum part 2 Aventine
- Brain Stimulation/Consciousness Technology (Bikson, Sanguinetti, Berman, Rohan, Martin) Delphi
- Resonance, Life and Consciousness (Schooler, Hunt, Bandyopadhyay, Craddock, Grossberg, Chew) Athena A
- Consciousness and the Arts (Day, Seifert, Kostiner, Electra, QUALIATIK) Syros
- Redefining Well-Being: Consciousness (Jain, Guarneri, King, Evanow, Muehsam, Vieten) Mykonos A

## Monday Evening Public Lecture

Institute of the Americas

**June 5, 2017 - 6:30 pm to 8:00 pm**

**Sir Roger Penrose**

***Fashion, Faith and Fantasy and the Big Questions in Modern Physics***

Institute of the Americas

10111 N. Torrey Pines Rd. • La Jolla, CA 92037 USA

<https://www.iamericas.org/en>

30 minute walk, 8 minute ride,

Simulcasts to Hyatt Regency La Jolla

## Tuesday Morning Workshops

**June 6, 2017 9:00 am to 1:00 pm**

- Language and Consciousness (T. Bever, Chomsky, Spivey, O.Bever) Mykonos A
- Deepak Chopra - ‘The enlightened brain’ (Chopra) Aventine
- David Bohm Centennial (Pylkkanen, Musser, Walleczek) Athenia A
- Quantum Brain Biology (Craddock, Tuszyński, Hameroff, Bandyopadhyay) Vicino

## Vicino Ballroom

## CONCURRENT SESSIONS - Tuesday C1-C8

**June 6, 2017 5:00 to 7:55 pm**

*C1: Dualism and Panpsychism*

**Schriner, Gradowski, Llamas, Remler, Kuznetsov, Kent, Kernion, Pylkkanen**

*Mykonos*

*C2: Memory and Consciousness*

**Nakano, Hsin-ping Wu, Gottlieb, Heile, Anokhin, Fazekas, Loisi, Xiao-Lan Song**

*Athenia*

*C3: Artificial Intelligence/Virtual Reality 1*

**Verschere, Lin, Bezzubova, Gackenbach, Leping Zha, Duan, Yang Liu, Elamrani**

*Delphi*

*C4: Consciousness and Molecular Biology*

**Wolf, Saluja, Sahni, Schiffer, Baker, Poola, Jiang**

*Milos*

*C5: Consciousness and Models of Reality 1*

**Markan, Yan He, Keppler, Bolaros, Gruber, Beichler, Andrews**

*Rhodes*

*C6: Altered States of Consciousness*

**Lopez-Silva, Dolcini, Villanueva, Gerken, Polito, Kanta Arora**

*Syros*

*C7: Quantum Ontologies 1*

**Globus, Rosseinsky, Rangarajan, Gaertner, Satsangi, Thomas, Prakash**

*Vicino*

*C8: Consciousness and Social Interactions*

**Olson, Mayhofer, Carrassi, Di Pizzo, Gautam, Harrison, Lloyd**

*Andros*

## Wednesday, C9-C16

**June 7, 2017 5:00 to 7:55 pm**

*C9: Free Will and Intentionality*

**Besedin, Munoz-Jimenez, Guery, Westcombe, MacNeill, Elliott, Von Schweber**

*Mykonos*

*C10: Complexity and Brain Organization*

**Miyahara, Isler, Matsui, Bar Lev, Lahav, Maninder, Virmani**

*Athenia*

*C11: Language and Autism*

**Mizumoto, Pensotti, Mertsalov, Bhatnagar, Rai, Powell**

*Delphi*

*C12: Consciousness and Evolution*

**Fredriksson, Whiteley, Morrison, Bakker, Beran, Hamilton, Tirumalai, Oberst**

*Milos*

*C13: Meditation and Consciousness*

**Ahuja, Katyal, Saran, Goldstein, Birch, Mishra, Willman**

*Rhodes*

*C14: Consciousness and Quantum Measurement*

**McQueen, Kathpalia, Bhaumik, Roy, Camargo-Perez, Brophy, Gunji**

*Aventine*

*C15: Consciousness and Models of Reality 2*

**Korotkov, Haoying Liu, Awret, Alessandrini, Agarwal, Allsop**

*Syros*

*C16: Vibrations, Resonance and Consciousness*

**Roberts, Burgarella, Schooler, Hunt, Pyari, Katkova, Safin, Krishnananda**

*Andros*

## Friday, C17-C24

**June 9, 2017 5:00 to 7:55 pm**

*C17: Explanatory Gap and Intentionality*

**Ebbers, Choate, Black, Xinyu Wei, Ruggeri, Jianfeng Li, Ting-An Lin**

*Mykonos*

*C18: Neuroscience Topics*

**Dinis-Pereira, Yu Feng, Clark, Persuh, Sanguinetti, Lei Zhang, Bettinger**

*Athenia*

*C19: Consciousness and Unconscious Processes*

**Ginzburg, Six, Stevenson, Gutman, Norman, Hedne**

*Delphi*

*C20: Mind Body*

**McKusick, Jain, Mruthinti, Evanow, Vieten, Yijun Liu,**

*Milos*

*C21: Artificial Intelligence and Models of Reality*

**Panov, Beck, Shirtz, Charan, Singh, Jyoti Kumar Arora**

*Rhodes*

*C22: Consciousness and Models of Reality 3*

**Khabeev, Narayanan, Jain, Cortel, Kim, Valladares, Preeti Srivistava, Ju Hyoung Lee**

*Syros*

*C23: Consciousness and the Arts*

**Day, Menshikova, Colbert, Kostiner, Malhotra, Idnani**

*Andros*

*C24: Quantum Ontologies 2*

**Hankey, Narayan, Rulin Xiu, Knox, Kohl, Blum, Green**

*Palatine*

**Wednesday, June 7, 7:00 to 10:00 pm**

## POSTER SESSION 1

**P 1**

Agarwal, Hans

Khatkale, Swati

Satsangi, Sumiran

Agarwal, Sapna

Khurana, Lokesh

Saxena, Rubina

Agarwal, MD, Siddharth

Kumar, Vinit

Sharma, Premkali

Alakh, Saini

Markan, Nagma

Sharma, Pallavi

Azevedo, Erico

Mathur, Reena

Sharma Mathur, Payal

Bhasin, Shobha

Mathur, Gazal

Shivhare, Neha

Bhasin, Rajneesh

Misra, Rupali

Singh, Sonal

Bhat, Seema

Mittal, Priyanka

Singh, Majer

Bommireddipalli, Aashiq

Parmar, Renu Singh

Singh, Meenu

Buglo, Elena

Paul, Sandeep

Sinha, Neha

Chellapilla, Patvardhan

Poudel, Ananda

Srivastava, Savita

Datta, Tapas

Prokash, Richa

Srivastava, Sumita

Gorjup, Rado

Pyari, Satgur

Srivastava, Ashima

Gupta, Shanti

Ramchandran, Sundaram

Srivastava, Kundan

Gupta, Saatviki

Rana, Neeti

Sundaram, Prem

Gupta, Chhavi

Saini, Dayal

Swami, Hardas

Gupta, Malvika

Sandhu, Dayal

Swaroop, Arati

Jois, Suresh

Saravanan, B

Tiwari, Lalitesh

Kapoor, Toran

Satsangee, Nandita

Trivedi, Chandra Prakash

Khan, Abdul Sameer

Satsangi, Tatavarty Neh

Zadey, Siddhesh

**Friday, June 9, 7:00 to 10:00 pm**

## POSTER SESSION 2

**P 2**

Andrea, Mills

Dzhaber, Milana

Saini, Alakh

Aviv, Dorit

Gálíková, Silvia

Sarfarazi, Mohsen

Barbosa, Paulo

Graca, Nebojsa

Schafer, Robert

Barreto, Maribel

Guta, Mihretu

Shetkar, Rashmi (Reshma)

Barsotti, Tiffany

Hong, Injae

Sood, Deepshikha Nigam

Bozorgi, Gooya

Kashyap, Anhad

Steinorth, Ulrich

Brito, Ana

Kozyreva, Olga

Swami, B V

Chen, Shuo

Lee, Yeseul

Usvapelto, Ilona

Chiarella, Horacio Andres

Mathur, Ajeet

Ventureyra, Scott

Coelho, Jonas

Melkikh, Aleksei

Vucolova, Ludmila

Cohly, Hari

Muehsam, David

Wang, Cheng

Costa, Juliana

Pankovski, Toso

Williams, Matthew

Costa, Laura

Patil, Dnyandeo

Wong, Ming

Daneshfard, Babak

Peerally, Abed

Zegarac, Milica

Davis, Scott

Plotke, Robert

Zhang, Jiahe

Deli, Eva

Safina, Natalia

Zhu, Yaoping

## ART-TECH-HEALTH EXHIBITS

**Wednesday and Friday 7:00-10:00 pm**

**Paul Thomas**, Quantum Consciousness, Art and Design

**Margaret Dolinsky**, Creativity and its Mediation for Navigating between Reality and Virtual Reality

**Pam Payne**, The Telenoetic Medium - Presentation of The Author’s Video Artwork, A Mnemonic Device to Facilitate Meditative, Noetic States of Consciousness

**Jens Pilegaard**, Musings on Captured Moments

**Naama Kostiner**, Create Your Own Flow

**Jiyun Park**, W[hole]ness - Scaling Consciousness/Cosmologies Through Geometry

**Jeanne Marie Sanguinetti** - Pac Man Line

**Mimi Loup Brown**, Artist

**Cyndi Sanguinetti**, Artist

## SCIENCE AND TECHNOLOGY EXHIBITS

**Wednesday and Friday 7:00-10:00 pm**

**Vielight Inc.**

Infrared Photomodulation and Neurofeedback for Alzheimer’s disease

**Marvin Berman**

## Grand Foyer

## Grand Foyer

## Grand Foyer

## Grand Foyer