**Stuart R. Hameroff, MD**

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**CV short: November 14, 2022**

**Position title**

Emeritus Professor, Anesthesiology

Emeritus Professor, Psychology

Director, Co-Founder, Center for Consciousness Studies

Attending Anesthesiologist, Banner-University Medical Center

University of Arizona, Tucson, Arizona

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| **Education/Training**  **Institution and Location** | **Degree** | **Years** | **Field of Study** |
| University of Pittsburgh Pittsburgh, PA | B.S. | 1965-69 | Chemistry, Physics Mathematics |
| Hahnemann Medical College Philadelphia, PA | M.D. | 1969-73 | Medicine |
| Internship, Tucson Medical Center  Tucson, AZ  Residency  Residency |  | 1973-74 | Integrated |

Residency in Anesthesiology

University of Arizona Medical Center 1975-77 Anesthesiology

Tucson, AZ

**Employment**

**1977-present** Attending Physician/Anesthesiologist, Department of Anesthesiology, University Hospital, University Medical Center, University Physicians Inc., University of Arizona, Health Sciences Center, UAHN, Banner-University Medical Center, The University of Arizona, Tucson, Arizona

**1977-1978** Instructor, Anesthesiology, University of Arizona, College of Medicine, Tucson, Arizona

**1978-1984** Assistant Professor, Anesthesiology

**1979** Certified by the American Board of Anesthesiology

**1979-1985** Director, Pain Clinic/Pain Service, University Medical Center

**1984 -1995** Associate Professor with Tenure, Anesthesiology

**1994** Joint Appointment, Associate Professor, Department of Psychology

**1995** Professor, Department of Anesthesiology, College of Medicine

**1995** Professor, Department of Psychology, University of Arizona

**1999** Co-Founder, Associate Director, Center for Consciousness Studies, The University of Arizona

**2003-present** Emeritus Professor, Anesthesiology and Psychology, The University of Arizona

**2004-present** Director, Center for Consciousness Studies, The University of Arizona

**Biosketch – Stuart Hameroff**

Stuart Hameroff MD is Emeritus Professor of Anesthesiology & Psychology, Director of the Center for Consciousness Studies, and attending anesthesiologist at Banner-University Medical Centers, all at the University of Arizona in Tucson.

Hameroff grew up in Cleveland, Ohio, and attended the University of Pittsburgh, studying chemistry, physics, mathematics and philosophy of mind.  At Hahnemann Medical College in Philadelphia

in the early 1970s, he spent time in a cancer research lab studying cell division/mitosis becoming interested in how mitotic spindles, composed of cylindrical protein lattice polymers called microtubules, were able to very precisely separate and move chromosomes in a delicate dance. Comparing the microtubule lattice to Boolean computer matrices, Hameroff began to develop an idea that microtubules were computer-like sources of biological intelligence, and possibly consciousness.

After medical school, Hameroff trained in the department of anesthesiology at the University of Arizona Medical Center in Tucson. He was recruited and mentored by the department’s

founding chair Burnell Brown Jr, MD, PhD, who told him that understanding how anesthesia works was the key to understanding consciousness. And he handed him a paper showing anesthetics affected microtubules. Hameroff began residency in the department of anesthesiology in 1975, and joined the faculty in 1977, a position he still holds as emeritus professor and practicing anesthesiologist at (now) Banner-University Medical Centers.

Over his 47 years in the department Hameroff has pursued research in chronic pain, high frequency ventilation and transcranial ultrasound (TUS) as a clinical tool addressing microtubule resonances to treat mental and cognitive disorders. But his main interest has been related to microtubules, anesthesia and consciousness.

In the 1980s Hameroff collaborated with physicists to develop models of information processing in microtubules based on ‘cellular automata’ (‘microtubule automata’) able to interact with membrane and synaptic activities.  Applied to microtubules in brain neurons, the approach theoretically increased

brain information processing capacity enormously. But it didn’t begin to explain the nature, or origin of consciousness.

In 2001 Hameroff read ‘The emperor’s new mind’ by Roger Penrose which proposed that consciousness

stemmed from collapse (quantum state reduction) of the quantum wavefunction due to an objective

threshold related to gravity (objective reduction, ‘OR’), and that the brain must contain some form

of quantum computer which would organize or orchestrate these OR quantum events.

Hameroff suggested to Penrose that microtubules inside brain neurons might be the biological quantum computers he was looking for. Penrose agreed, and the two teamed up to develop the ‘Orchestrated objective reduction’, ‘Orch OR’ theory of consciousness which connects brain activity to quantum state reductions at the most basic level of the universe - fundamental spacetime geometry – where Penrose had proposed Platonic information could influence conscious choices and perceptions.

Orch OR has been viewed skeptically by scientists and philosophers because technological quantum computers require extremely cold temperatures to avoid thermal “decoherence”, and the brain is a warm 37.6 degrees Centigrade. But recent experiments which are part of the Templeton World Charity Foundation (TWCF) program “Accelerating Research in Consciousness” have demonstrated quantum effects in microtubules at ambient temperatures. Experiments in Greg Scholes’ lab at Princeton, and in Aristide Dogariu’s lab at Central Florida show that quantum optical effects in microtubules are dampened by anesthetics which selectively block consciousness.  The Open Science Foundation (‘OSF’) registration for the project is here <https://osf.io/zqnjd/>, and the first paper submitted to a top journal and is posted here on the BioArXiV <https://arxiv.org/abs/2208.10628>

In 1994, with University of Arizona colleagues Al Kaszniak in Psychology, Alwyn Scott in Mathematics, Jim Laukes in Extended University, and subsequently David Chalmers in Philosophy and Stuart Hameroff started an interdisciplinary, international conference series ‘The Science of Consciousness’ (‘TSC’).  Held in even-numbered years in Tucson, and odd-numbered years elsewhere around the world, the 29th annual TSC was held in April 2022 in Tucson. The 2023 conference will be held in Taormina, Sicily co-organized with Riccardo Manzotti and colleagues.

In 1998, with Kaszniak and Scott, and a 1.4-million-dollar grant from the Fetzer Institute,

Hameroff co-founded the University of Arizona Center for Consciousness Studies (CCS), served as associate director, and succeeded Kaszniak and then Chalmers, as director in 2004. With Abi Behar-Montefiore as assistant director and conference manager, CCS has subsisted since 2004 and in 2018 moved administratively to the College of Social and Behavioral Sciences. University of Arizona Regents Professor Tom Bever has acted as CCS Co-Director and, with support from the Eugene Jhong Family Foundation, has developed an educational curriculum for which Hameroff will teach a course ‘Introduction to the science of consciousness’ as he transitions from clinical work to research and education. CCS Associate Directors include psychologist Jay Sanguinetti, an authority in non-invasive brain modulation including transcranial ultrasound, and another Regents professor, planetary scientist Dante Lauretta who studies astrobiology and the origin of life and consciousness. Abi Behar-Montefiore continues as CCS stalwart Assistant Director and conference manager.

Hameroff has written or edited 6 books, and several hundred scientific articles and book chapters, lectured on 6 continents, appeared in the film ‘WhattheBleep?’ and numerous TV shows about consciousness on BBC, PBS, Discovery, OWN, National Geographic, and History Channel.

**Books Authored or Edited**

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| Satsangi P, Hameroff SR, Sahni V, Dua P (2018) **Consciousness: Integrating**  **Eastern and Western Perspectives**, New Age Books |

Hameroff SR, Kaszniak AW & Chalmers D. (Eds.) **(1999).** **Toward a Science of Consciousness III:** The Third Tucson Discussions and Debates. Cambridge, MA: MIT Press/Bradford Books.

Hameroff SR, Kaszniak AW & Scott AC. (Eds.) **(1998).** **Toward a Science of Consciousness II:** The Second Tucson Discussions and Debates. Cambridge, MA: MIT Press/Bradford Books.

Hameroff SR, Kaszniak AW & Scott AC. (Eds.) (**1996). Toward a Science of Consciousness: The First** **Tucson Discussions and Debates.** Cambridge, MA: MIT Press/Bradford Books.

Koruga DL, Hameroff SR, Withers J, Loutfy R, & Sundareshan M. (Eds.) **(1993).** **Fullerene C60 – History, Physics, Nanobiology, Nanotechnology**. Amsterdam: Elsevier-North Holland, Amsterdam - Elsevier Science Ltd; First Edition (May 1, 1993) ISBN-13: 978-0444898333. ISBN-10: 0444898336

Hameroff SR. (1987).**Ultimate Computing: Biomolecular Consciousness and NanoTechnology.** Amsterdam: Elsevier-North Holland. eBook: 978-0-444-60009-7

**Book Chapters and Proceedings**

Hameroff S **(2021)** **Orch OR and the quantum biology of consciousness In: Quantum mechanics and consciousness,** Edited by Shan Gao, Oxford University Press, in press.

Hameroff S **(2021)** **Consciousness and Orch OR – Penrose, Bohm, Darwin, Freud and Chomsky,** In **Unfolding the Big Picture. Essays in Honour of Paavo Pylkkänen,** P. Limnell & T Vaden eds. Philosophical Studies from the University of Helsinki (2021).

Craddock, T.J., Kurian P., Tuszynski J.A., & Hameroff S.R. **(2019)** **Quantum Processes in Neurophotonics and the Origin of the Brain's Spatiotemporal Hierarchy.** In R.R. Alfano & L. Shi (Eds.), Neurophotonics and Biomedical Spectroscopy. (189-213). Elsevier. [abstract](http://sciencedirect.com/science/article/pii/B9780323480673000093?via%3Dihub)

Hameroff, S., & Penrose R. **(2016).** “**Consciousness in the Universe: An Updated Review of the ‘Orch OR’** **Theory.”** In R. Poznanski, J.A. Tuszynski, & T.E. Feinberg, (Eds.), The Biophysics of Consciousness: A Foundational Approach. (517-599; Chap. 14). Singapore: World Scientific. [abstract](http://anesth.medicine.arizona.edu/sites/default/files/hameroff-penrose_updated_review_of_orch_or_2016_b2237_ch-14_revised-2-3.pdf)

Craddock, T., Hameroff, S., Tuszynski, J.A. **(2016).** **“The "Quantum Underground": Where Life and** **Consciousness Originate.”** In R. Poznanski, J.A.Tuszynski, T.E. Feinberg, (Eds.), The Biophysics of Consciousness – Foundational Approaches. (Chap. 13). Singapore: World Scientific.

Hameroff, S. **(2016).** **“The Quantum Origin of Life – How the brain evolved to feel good.”** In M. Tabeyranc & F. J. Ayala (Eds.), On Human Nature: Biology, Psychology, Ethics, Politics, and Religion. Academic Press. Elsevier. (2017).

Satsangi, P.S., Hameroff, S. & Sahni, V. **(2016)** “**Does Consciousness Guide the Universe?”** In Satsangi, P.S., Hameroff, S., (Eds.), Consciousness: Integrating Eastern and Western Perspectives. (351-373; Sec. 2) New Age Books.

Ebner, M., & Hameroff, S. **(2015) “Modeling Figure/Ground Separation with a ‘Mobile Zone’ of Laterally-Connected Spiking Neurons.**” In Irena Roterman-Konieczna, (Ed.), Simulationin Medicine: Preclinical and Clinical Approach. Berlin: de Gruyter.

Alfonseca, A, Ortega, M de la Cruz, Hameroff, S.R. & Lahoz-Beltra, R. **(2015)** **“A Model of Quantum-von Neumann Hybrid Cellular Automata: Principles and simulation of quantum coherent superposition and decoherence in cytoskeletal microtubules.**” In Quantum Information and Computation. (22-36). Rinton Press.

Sanguinetti, J.L., Smith E., Allen, John J.B., Hameroff, S. **(2014)** **“Human Brain Stimulation with Transcranial Ultrasound: Potential Applications for Mental Health.”** In Bioelectromagnetic and Subtle Energy Medicine. (355-360; 2nd edition). CRC Press.

Hameroff, S. **(2014) “Consciousness, Free Will and Quantum Brain Biology –The ‘Orch OR’ Theory.**” In A. Corradini, U. Meixner, (Eds.), Quantum Physics Meets the Philosophy of Mind.(99-134).Berlin: De Gruyter.

Hameroff, S., Pylkkanen, P., & Gennaro, R. **(2014) 'HOT to DOT’ – A ‘Deeper order thought’ theory of** **consciousness.”** In D. Chopra, (Ed.), Brain, Mind, Cosmos: The Nature of Our Existence and the Universe*.*  (Chapter 15; Series Book 1), Sages and Scientists (Amazon Digital Services, Inc). [Kindle Ed]

Hameroff, S.R. **(2007)** **“That’s Life’ – The geometry of pi electron resonance clouds**.” In D. Abbot, P. Davies & A.K. Pati, (Eds.). Quantum aspects of life. Biology. Imperial College Press.

Hameroff, Stuart **(2007) “Consciousness, Neurobiology and Quantum Mechanics: The Case for Connection.”** In: The Emerging Physics of Consciousness, edited by Jack Tuszynski Springer-Verlag, (2007). [pdf.link](http://quantumconsciousness.org/sites/default/files/2007%20Hameroff_Case%20for%20a%20Connection%20in%20Tuszynski%20ed%20The%20Emerging%20Physics%20of%20Consciousness.pdf)

Hameroff, S. & Tuszynski, J. (**2004** June**) “Quantum states in proteins and protein assemblies.”** Proceedings of SPIE, Conference on Fluctuationa and Noise, Canary Islands.

Hameroff, S.R., & Tuszynski, J. **(2003)** **“Search for quantum and classical modes of information processing** **in microtubules: Implications for the living state.”** In Franco Musumeci & Mae-Wan Ho (Eds.), *Bioenergetic organization in living systems*. Singapore: World Scientific.

Hameroff, S.R. **(2003)** “**Time, consciousness and quantum events in fundamental spacetime geometry.”** In R. Buccheri & M. Saniga (Eds.), The nature of time: Physics, geometry and perception: Proceedings of a NATO Advanced Research Workshop. [link](https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:511fffeb-01d9-4589-ac60-c076000a2205)

Hameroff, S.R. **(2003)** **“Consciousness, Whitehead and quantum computation in the brain:** **Panprotopsychism meets the physics of fundamental spacetime geometry.”** In M. Weber, (Ed.), *Whitehead Process Network Compendium*.

Hameroff, S.R., & Woolf N.J. **(2002)** “**Quantum consciousness: A cortical neural circuit.”** In Naoyuki Osaka, (Ed.), Neural Basis of Consciousness.(167-200)Amsterdam: John Benjamins.

Hameroff, S. **(2001)** “**Biological feasibility of quantum approaches to consciousness - The Penrose-Hameroff “Orch OR” model.”** In Philip van Looke, (Ed.), The Physical Nature of Consciousness. (1-61). John Benjamins.

Hameroff, Stuart. **(2001)** [**Consciousness, The Brain and Spacetime Geometry.**](http://quantum.webhost.uits.arizona.edu/prod/sites/default/files/cajal.pdf)[From the *Annals of the New York Academy of Sciences*, Special issue: Cajal and consciousness, Scientific Approaches to Consciousness on the Centennial of Ramon y Cajal's Textura,  Marijuan P., eds, Volume 929;](http://quantum.webhost.uits.arizona.edu/prod/sites/default/files/cajal.pdf) 74-104. [link](https://www.scribd.com/document/364482289/Cajal-and-Consciousness-Scientific-Approaches-to-Consciousness-on-the-Centennial-of-Ramon-y-Cajal-s-Textura-2001)

Hameroff, S.R. **(1999)** “**Anesthesia.”** In J. Brockman (Ed.), Greatest inventions of the past 2000 years. (94-98). Simon and Schuster.

Hameroff, S.R. **(1998)** **“Funda-Mental geometry: The Penrose-Hameroff “Orch OR” model of consciousness.”** In Huggett N.S.A., Mason L.J., Tod K.P., Tsou S.T., & Woodhouse N.M.J. (Eds.), The Geometric Universe -Science, geometry and the work of Roger Penrose. (135-160).

Hameroff, S.R. **(1998)** **“Did Consciousness Cause the Cambrian Evolutionary Explosion?”** In Hameroff, S.R, Kaszniak A.W., & Scott, A.C., (Eds.), Toward a Science of Consciousness II - The Second TucsonDiscussions and Debates. (421-437). Cambridge, MA: MIT Press.

Hameroff, S., Scott, A. **(1998)** **"A Sonoran Afternoon" -** Discussion on the relevance of quantum theory to consciousness.” In Hameroff, S.R., Kaszniak, A.W. & Scott, A.C., (Eds.), (635-643). Toward a Science of Consciousness II - The Second Tucson Discussions and Debates, Cambridge, MA: MIT Press.

Hameroff, S. **(1998)** “**More neural than thou (A reply to Patricia Churchland),”** In Hameroff, S.R., Kaszniak, A.W. & Scott, A.C., (Eds.), (197-213). Toward a Science of Consciousness II - The Second Tucson Discussions and Debates,Cambridge, MA: MIT Press.

Hameroff, S. **(1997) “Consciousness Studies: An overview.”** In Taddei-Ferretti, C., Musio, C., (Eds.), (3-13). Neuronal and psychological aspects of consciousness. Series on Biophysics and Biocybernetics. (Vol. 8)-Biocybernetics. World Scientific.

Hameroff, S. **(1997) “Quantum computing in microtubules: The Penrose-Hameroff Orch OR Model.”** In Taddei-Ferretti, C., Musio, C., (Eds.), (479-506). Neuronal and psychological aspects of consciousness, Series on Biophysics and Biocybernetics Vol 8 - Biocybernetics. World Scientific.

Hameroff, S.R. **(1997) “Quantum computing in microtubules: an intra-neural correlate of consciousness?”** In Cognitive Studies: Bulletin of the Japanese Cognitive Science Society. 4(3): 67-92).

Boswell, M.V., Hameroff, S.R., **(1996) “Theoretical mechanisms of general anesthesia.**” In V.J. Collins (Ed.), *Principles of Anesthesiology*, 3rd Edition, Volume 3: The Physiologic and Pharmacologic Basis of Anesthesia, Philadelphia: Lea and Feiberger.

Hameroff, S.R. **(1996)** **“Cytoplasmic Gel States and Ordered Water: Possible Roles** in Biological Quantum Coherence.” *Proceedings* - 2nd Annual Advanced Water Sciences Symposium, Dallas, TX.

Hameroff, S., Penrose, R., **(1996)** **“Orchestrated reduction of quantum coherence in brain microtubules: a** **model for consciousness.”** In S. Hameroff, A. Kaszniak & A. Scott., (Eds.), (507-540). Toward a Science of Consciousness - The First Tucson Discussions and Debates. Cambridge, MA: MIT Press. [A Model for Consciousness 1996.pdf](http://quantumconsciousness.org/sites/default/files/1996%20Orchestrated%20Objective%20Reduction%20of%20Quantum%20Coherence%20in%20Brain%20Microtubules%20-%20A%20Model%20For%20Consciousness.pdf)

Louria, D., Hameroff, S., **(1996)** **“Computer simulation of anesthetic binding in protein hydrophobic** **pockets.”** In S. Hameroff, A. Kaszniak & A. Scott., (Eds.), Toward a Science of Consciousness – The First Tucson Discussions and Debates. Cambridge, MA: MIT Press.

Hameroff, S., Penrose, R., **(1996) “Conscious events as orchestrated space-time selections**.” In D. Chalmers & J. Shear (Eds.), Explaining consciousness - the “hard problem” of conscious experience.

Hameroff, S., Penrose, R., **(1995)** **“Orchestrated reduction of quantum coherence in brain microtubules: a** **model for consciousness?”** In J. King and K. Pribram (Eds.), Scales in Conscious Experience, Is the brain too important to be left to specialists to study? Mahway, NJ: Lawrence Erlbaum. (243-274).

Hameroff, S.R., Polson, J.S., Watt, R.C. **(1994)** **“Monitoring Anesthetic Depth.”** In C. Blitt, Churchill Livingstone (Eds.), *Monitoring in Anesthesia and Critical Care Medicine-* 3rd ed. (491-507).

Samsonovich A, Scott, A, Hameroff SR. **(1992) Acousto-conformational phase transitions in the cytoskeleton, adaptive resonance networks with nonlinear synapses and trainable intraneuronal pattern recognition.** Proceedings 1992 IJCNN International and Joint Conference on Neural Networks. 7-11 June, 1:565–569.

Watt RC, Navabi MJ, Scipione PJ, Hameroff SR, Maslana ES. **(1990)** Neural **Network Estimation of Anesthetic** **Level Using Eeg Spectral Signatures**. Engineering in Medicine and Biology Society, 1990. Proceedings of the Twelfth Annual International Conference of the IEEE. 1-4 Nov 1990; 12:5: 2017-2018. [link](https://ieeexplore.ieee.org/abstract/document/692136)

Hameroff, SR, Vernetta LA, Lee YC, Sarid D, Watt RC, **(1990)** **Atomic Resolution of Cytoskeletal Protein by** **Scanning Tunneling Microscopy.** Proceedings of the Twelfth Annual International Conference of the IEEE*,* 1-4 Nov. 1990; 1724-1724.  [link](https://ieeexplore.ieee.org/document/691983)

[Navabi MJ, Watt RC, Mylrea KC, Hameroff SR. **(1990) Classification of CO2 Waveforms Using Artificial Neural**](http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&amp;arnumber=691836) [**Networks**. Engineering in Medicine and Biology Society.](http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&amp;arnumber=691836) Proceedings of the Twelfth Annual International Conference of the IEEE. 1-4 Nov 1990; 1455-1456. [link](https://ieeexplore.ieee.org/document/691836?reload=true&arnumber=691836)

Hameroff SR, Navabi MJ, Watt RC, Mylrea KC. **(1990)** **Smart Alarms in Anesthesia Heart Rate and ECG** **Monitoring and Event Recognition Using Neural Network and Algorithmic Methods**. Engineering in Medicine and Biology Society. Proceedings of the Twelfth Annual International Conference of the IEEE*.* 1- 4 Nov 1990; 2000-2001.  [link](https://ieeexplore.ieee.org/document/692128)

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Hameroff S, Simic-Krstic Y, Koruga, D, Kelley M, McCuskey R, Krasovich M, Schneiker C. **(1989) Scanning tunneling microscopy of microtubules**. Engineering in Medicine and Biology Society, Images of the Twenty-First Century. Proceedings of the Annual International Conference of the IEEE Engineering in Medicine andBiology Society. 9-12 November 1989. 4:1350-1351. [link](https://avs.scitation.org/doi/abs/10.1116/1.576164)

Rasmussen S, Karampurwala H, Vaidyanath R, Hameroff S. **(1989) Emergent computation in microtubule model networks.** Engineering in Medicine and Biology Society. Images of the Twenty-First Century. Proceedings of the Annual International Conference of the IEEE Engineeringin 9-12 Nov 1989. 4:1368-1369. [link](https://ieeexplore.ieee.org/document/96244)

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**Peer-Reviewed Publications - selection**

# Kalra AP, Benny A, Travis SM, Zizzi EA, Morales-Sanchez A, Oblinsky DG, Craddock TJA, Hameroff SR, MacIver MB, Tuszynski, Petry S, Penrose R, Scholes GD. **Electronic Energy Migration in Microtubules**, Submitted Aug 22, 2022 Now at:

# <https://arxiv.org/abs/2208.10628>

###### Hameroff, S (2022) **Consciousness, Cognition and the Neuronal Cytoskeleton – A New Paradigm Needed in Neuroscience**. Front. Mol. Neurosci. <https://doi.org/10.3389/fnmol.2022.869935>

Aminpour M, Hameroff S, Tuszynski J (2022) **How COVID-19 Hijacks the Cytoskeleton: Therapeutic Implications** Life (Basel) 12(6):814. doi: 10.3390/life12060814. PMID: 35743845; PMCID: PMC9225596.

###### Hameroff, Stuart (2020) **‘Orch OR’ is the most complete, and most easily falsifiable theory of consciousness,** Cognitive Neuroscience,; Pub online: 24 Nov <https://www.tandfonline.com/doi/full/10.1080/17588928.2020.1839037>

Sanguinetti JL, Hameroff S, Smith EEE, Sato T, Daft CMW, Tyler WJ, Allen JJB. **Transcranial focused ultrasound to the right prefrontal cortex improves mood and alters functional connectivity in humans** Frontiers in Human Neuroscience, **2020;** 14:52 <https://www.frontiersin.org/article/10.3389/fnhum.2020.00052>

Hameroff S, Muotri Alysson R. (**2020**) **Testing for consciousness in cerebral**

**organoids,** Trends in Cell and Molecular Biology 15:43-57

Hameroff, Stuart. **Consciousness and quantum state reduction – Which comes first**? Activitas Nervosa Superior, April **2019**; 61:31-40. [link](file:///Users/abimontefiore/Downloads/Hameroff%20-%20Cons%20and%20Quantum%20State%20Reduction%20Apr%202019%20.pdf)

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Hameroff, SR. **“Change the Music: Psychotherapy and Brain Vibrations.”** The Neuropsychotherapist, April **2016**; Vol 4, 4, 31-35. [pdf](http://consciousness.arizona.edu/documents/neuropsychotherapist-2.pdf)

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Craddock, J.A. Travis, Friesen D, Mane J, Hameroff SR, and Tuszynski JA. “**The Feasibility of Coherent Energy Transfer in Microtubules.”** Journal of the Royal Society Interface, **2014;** Nov 6; 11(100).  [link](https://royalsocietypublishing.org/doi/full/10.1098/rsif.2014.0677)

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**Grants/Awards**

2021 Alvin J. Clark Foundation for Science & Roger Penrose conference

2021 Mani Bhaumik for Science & Roger Penrose conference

2021 Eugene Zhong Family Foundation - CCS Educational grant (Tom Bever) $75,000

2020 Templeton World Charity Foundation – Experiments to test Orch OR theory

(through University of Alberta) $230,000

2020 Fetzer Institute – The Science of Consciousness Online conference $50,000

2020 Templeton World Charity Foundation – Testing Orch OR Quantum Theory of Consciousness

– conference 40,000

2020 Fetzer Institute – Testing Orch OR Theory of Consciousness $18,500

2020 Vielight – The Science of Consciousness Online conference $5,000

2020 Crowdfundng (Jay Sanguinetti) Transcranial ultrasound $68,000

2020 Alvin J. Clark Foundation – The Science of Consciousness Online Conference $10,550

2020 Eugene Zhong Family Foundation - CCS Educational grant (Tom Bever) $45,000

2020 Dennis Balson – TSC Conference $3,000

2020 Facilitating mindfulness training - TUS– with Jay Sanguinetti, Shinzen Young, J Allen,

Stuart Hameroff $68,000 – crowdfunding

2020 Sonication enhanced mindfulness acquisition, Atlantic Foundation, with Jay Sanguinetti,

S. Young $50,000

2019 Anonymous – TSC 2020 Conference $10,000

2019 Default mode network ultrasonic neuromodulation, Atlantic Foundation with J. Sanguinetti,

JA Allen $150,000

2019 Interlaken TSC Sponsors Alvin Clark and Mani Bhaumik $20,000

2018 Penrose Institute – Treating mental and cognitive disorders with Transcranial Ultrasound

(TUS), Penrose Foundation, CCS, S. Hameroff and J. Sanguinetti $150,000

2018 Univ. of Michigan CCS (George Mashour) – TSC Conference - $45,000

2018 Ron Gruber – TSC Conference - $500

2018 Alvin J. Clark Foundation – TSC Conference - $10,000

2018 Dennis Balson – TSC Conference $1500

2017 Mani Bhaumik – TSC Conference $10,000

2017 Alvin Clark – TSC Conference $10,000

2016 Center for Consciousness Science, U Michigan –TSC Conference Co-Sponsor $40,000

2016 Alvin J. Clark Foundation – TSC Conference - $10,000

2016 Dennis Balson – TSC Conference $1000

2016 Ron Gruber - TSC-Conference $500

2016 YeTaDel Foundation – TSC Conference $1000

2016 Mani Bhaumik – TSC Conference $10,000

2014 Mani Bhaumik - Toward a Science of Consciousness TSC-20th Anniversary

Conference Penrose Prize $10,000

2014 YeTaDel Foundation – TSC Conference $2500

2013-4 Transcranial ultrasound for mood enhancement, Thync/Neurotrek, with JA Allen,

J. Sanguinetti, Hameroff $89,998

2012 Monroe Institute – TSC Conference $5000

2012 David Benjamin Publishing– TSC Conference $1000

2011 Elata Inc – TSC Conference – $1000

2011 Chapman University – TSC Conference $2000

2011 Rustum Roy Award, Chopra Foundation $75,000

2011 Institute of Noetic Sciences, TUS Pilot Study $5,000

2011 USAF-AFOSR - 2011 TSC-Stockholm Conference, European Office; Asian Office of

Aerospace R&D $23,000

2009 Anonymous – TSC Conference $10,000

2009 Neti Neti – TSC Conference $10,000

2007 YeTaDeL Foundation Award for Quantum Approaches to Consciousness – TSC

Conference $13,5000

2003 Samueli Foundation Award for 2003 Quantum Mind conference $20,000

1998- Fetzer Institute Award to establish the Center for Consciousness Studies at the University

2001 of Arizona $1.4 million

1990-9 National Science Foundation (NSF) Nonlinear dynamics: Solitons in biomolecules (Co-PI

Alwyn Scott) $40,000

1982 Pfizer-Roerig Pharmaceuticals: Effects of the antidepressant doxepin in chronic pain $30,000

1996-2014 Woodward White Independent Survey, US Pacific Region, Best Doctors in America,

*(Neuroanesthesia)*

**Presentations, Press, Podcasts, Film**

Short list - see below Long list – see PDF

**Podcasts from Brian Keating, UC San Diego 2022**

Sir Roger Penrose & Stuart Hameroff: What is Consciousness? Part 1

<https://www.youtube.com/watch?v=DaXkyxTZB58>

# Sir Roger Penrose & Stuart Hameroff: Collapsing a theory of quantum consciousness? Part 2

<https://www.youtube.com/watch?v=OoDi856wLPM>

Penrose, Sir Roger and Hameroff, Stuart. Presentation. Consciousness and the Physics of the Brain.  [**The Qualcomm Institute**](https://www.youtube.com/channel/UCXtSt_iCM8XMy0Z-B2w9LSg)**.** Sanford Consortium for Regenerative Medicine - Roth Auditorium - La Jolla, CA. **January 10, 2020.** <https://www.youtube.com/watch?v=xGbgDf4HCHU>

Hameroff, S. Presentation.Anesthesia, Consciousness, Bohm and Penrose (EmQM17), **University of London, UK** – posted Oct 2020 - Emergent Quantum Mechanics **October 26-28, 2017** –Towards Ontology of Quantum Mechanics and the Conscious Agent, David Bohm Centennial Symposium, 4th International Symposium on Quantum Mechanics based on a “Deeper Level Theory”, Sponsored by Fetzer Franklin Fund.

<https://www.youtube.com/watch?v=xGbgDf4HCHU>

<https://emqm17.org/presentations/Stuart-Hameroff/>

* [**http://en.wikipedia.org/wiki/Stuart\_Hameroff**](http://en.wikipedia.org/wiki/Stuart_Hameroff)

Note: Hameroff, S **(2019).** The Microtubule Quantum Vibration Theory of Anesthetic Action, Invited update to Wikipedia page ‘Theories of General Anesthetic Action’

Hameroff, S. Presentation. Is Your Brain Really a Computer? Sand Conference, **2019.** <https://www.youtube.com/watch?v=mrdkNeXUfGg>

Hameroff, S. The Science of Consciousness. Presentation. Sand Conference **2019.**

<https://www.youtube.com/watch?v=JHg-mr4aqWk&t=162s>

Hameroff, S. What is Consciousness? Interview by Robert Lawrence Kuhn. **Closer to Truth,** **PBS** April**,** **2014**. <https://www.youtube.com/watch?v=UhAVbX3K5Q4>

# Hameroff, S Anesthetic action links consciousness to quantum vibrations. **CalTech.** **June 11,** **2018.** <https://www.youtube.com/watch?v=VG8_hlnFdWM>

Hameroff, S. Quantum Consciousness. Interview with Robert Wright. **The Wright Show.** Meaning of Life.tv. **June 2018** <https://www.youtube.com/watch/Rnx4vf9eeWE>

Hameroff, S. What is a theory of consciousness for? **Sand Conference, 2018.**

<https://www.youtube.com/watch?v=h89zweg_AuE>; Hameroff, S. A Brief History of the Study of Consciousness. **Sand Conference 2015.** <https://www.youtube.com/watch/hKAVgq99o_w>

Hameroff, S. Physics of free will. Interview by Robert Lawrence Kuhn. **Closer to Truth, PBS.** **April 2014.** <https://www.youtube.com/watch?v=ztGNznlowic>

Hameroff, S. How Do Human Brains Function?Interview by Robert Lawrence Kuhn. **Closer to Truth, PBS. April 2014.** <https://www.youtube.com/watch?v=cJtYElOI75k>

Hameroff, S. Microtubules and quantum consciousness. **GF 2045 Initiative. Global Future 2nd International Congress. June, 2013. Alice Tully Hall. Lincoln Center**.

<https://www.youtube.com/watch?v=R5DqX9vDcOM>

<https://phys.org/news/2013-08-world-itskov-futurists-convene-gf2045_1.html>

Hameroff, S. Consciousness is more than computation. Interview with Nikola Danaylov. **September 2013.** **Singularity Weblog.** <https://www.youtube.com/watch?v=YpUVot-4GPM>

Hameroff, S. Presentation. The Future of Consciousness. TEDx Tucson. **December 2012.** <https://www.youtube.com/watch?v=1d5RetvkkuQ>

Hameroff, S. How quantum brain biology can save the world TEDx Brussels **2010** <https://www.youtube.com/watch?v=iIyEjh6ef_8>

**Additional Links:**

* <http://en.wikipedia.org/wiki/Stuart_Hameroff>

Note: Hameroff, S **(2019).** The Microtubule Quantum Vibration Theory of Anesthetic Action, Invited update to Wikipedia page ‘Theories of General Anesthetic Action’

**Websites:**

* [www.hameroff.arizona.edu](http://www.hameroff.arizona.edu)
* [www.quantumconsciousness.org](http://www.quantumconsciousness.org/)
* [www.consciousness.arizona.edu](http://www.consciousness.arizona.edu/)

#### [YouTube - The Science of Consciousness - TSC Conferences - Videos](https://www.youtube.com/channel/UCoNDcpkKXg2UioJKxTZI-ZA/videos)

**Databases**

[**PUB MED NIH**](https://pubmed.ncbi.nlm.nih.gov/?term=Hameroff%5bAuthor%5d&cmd=DetailsSearch)

[**ScienceDirect.com**](https://www.sciencedirect.com/)

[**Frontiers**](https://loop.frontiersin.org/people/1638840/overview)

[**Google Scholar**](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C3&q=stuart+hameroff&btnG=)

[**Wikipedia**](https://en.wikipedia.org/wiki/Stuart_Hameroff)

**CV, Bio Sketch, Publications & Media Lists**

[**Bio/CV**](https://live-azs-hameroff.pantheonsite.io/profile/bio)

**Websites | Databases**

**TSC Conferences, Quantum Mind**

1991 NATO Advanced Workshop: Coherence in Bioenergetic Systems - Tucson, Arizona

1994 Toward a Science of Consciousness (“TSC 1”) Apr 12-17 - Tucson, Arizona

1995 Toward a Science of Consciousness (“TSC 2”) Naples, Ischia, Italy (Chloe Taddei-Ferretti)

1996 Toward a Science of Consciousness (“TSC 3”) Apr 8-13 - Tucson, Arizona

1997 Toward a Science of Consciousness (“TSC 4”) Aug 18-24 - Elsinore, Denmark (Alwyn Scott)

1998 Toward a Science of Consciousness (“TSC 5”) Apr 27- May 2 - Tucson, Arizona

1999 Toward a Science of Consciousness (“TSC 6”) May 28 - Tokyo, Japan (Kunio Yasue, Mari Jibu)

1999 Quantum Mind 1 August - Flagstaff AZ

2000 Toward a Science of Consciousness (“TSC 7”) Apr 10-15 - Tucson, Arizona

2001 Toward a Science of Consciousness (“TSC 8”) Aug 6-11 - Skövde, Sweden (Paavo Pylkkanen)

2002 Toward a Science of Consciousness (“TSC 9”) Apr 8-12 - Tucson, Arizona

2003 Toward a Science of Consciousness (“TSC 10”) July 6-10 - Prague, Czech Republic (Ivan Havel)

2003 Quantum Mind 2 Mar 15-19 - Tucson, Arizona

2004 Toward a Science of Consciousness (“TSC 11”) Apr 7-11 - Tucson, Arizona

2005 Toward a Science of Consciousness (“TSC 12”) Aug 17-20 - Copenhagen, Denmark

(Morten Overgaard)

2006 Toward a Science of Consciousness (“TSC 13”) Apr 4-8 - Tucson, Arizona

2007 Quantum Mind 3 July 17-20 - Salzburg, Austria (Gustav Bernroider)

2007 Toward a Science of Consciousness (“TSC 14”) July 23-27 - Budapest, Hungary (George Kampis)

2008 Toward a Science of Consciousness (“TSC 15”) Apr 8-12 - Tucson, Arizona

2009 Toward a Science of Consciousness (“TSC 16”) June 11-14 - Hong Kong, China (Gino Yu)

2010 Toward a Science of Consciousness (“TSC 17”) Apr 12-17 - Tucson, Arizona

2011 Toward a Science of Consciousness (“TSC 18”) May 2-8 - Stockholm, Sweden (Christer Perfjell)

2012 Toward a Science of Consciousness (“TSC 19”) Apr 9-14 -Tucson, Arizona

2013 Toward a Science of Consciousness (“TSC 20”) Mar 3-9 - Agra, India (PS Satsangi, Vishal Sahni)

2014 Toward a Science of Consciousness (“TSC 21”) Apr 21-26 -Tucson, Arizona

2015 Toward a Science of Consciousness (“TSC 22”) June 9-13 - Helsinki, Finland (Paaavo Pylkkanen)

2016 The Science of Consciousness (“TSC 23”) Apr 25-30 - Tucson, Arizona

2017 The Science of Consciousness (“TSC 24”) June 5-10 - San Diego, California

2018 The Science of Consciousness (“TSC 25”) Apr 2-7 - Tucson, Arizona

2019 The Science of Consciousness (“TSC 26”) June 25-28 - Interlaken, Suisse

(Harald Atmanspacher)

2020 The Science of Consciousness (“TSC 27”) Sept 14-18 - Online

2021 Science and Roger Penrose (“TSC 28”) August 3-6 - Online

2022 The Science of Consciousness (“TSC 29”) April 18-23 - Tucson, Arizona

2023 The Science of Consciousness (“TSC 30”) TBA - Taormina, Sicily (Riccardo Manzotti)



#### **STUART HAMEROFF, MD**

#### **Anesthesiologist, Quantum Consciousness Theorist and Researcher**

##### ****Researcher into the nature of consciousness, the mechanism of anesthesia, and the quantum biology of microtubules****

##### ****Professor Emeritus, Departments of Anesthesiology and Psychology Banner-University Medical Center Director, The Center for Consciousness Studies, Colleges of Medicine, Science, and Social and Behavioral Sciences, The University of Arizona, Tucson, Arizona****

##### ****REVIEWER****

##### Anesthesiology, Anesthesia and Analgesia; Physica A; Medical Hypotheses; Bioessays; Trends in Cognitive Sciences (‘TICS’); Journal of Consciousness Studies; Progress in Biophysics and Molecular Biology; Bio-Algorithms and Med-Systems; Proceedings A Royal Societ,y, Nature Scientific Reports.

##### ****EDITORIAL BOARDS****

##### BioSystems; Journal of Consciousness Studies (Assoc. Editor)

##### ****PROFESSIONAL MEMBERSHIPS****

##### American Society of Anesthesiologists; Association of University Anesthesiologists; Society for Neuroscience; Association for the Scientific Study of Consciousness