

Consciousness or Quantum Brain Theory Made Easy for Psychiatrists and Nurses

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(Critters With 3 Dimensional Consciousness in a 4+
Dimensional Universe)

**CONTRA COSTA REGIONAL MEDICAL
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DISCLOSURE OF CONFLICT OF INTEREST

- Speaker has nothing to disclose

The Basic Theory

Orch OR (Orchestrated Objective Reduction) can be easily summed up by the following simple statement:

Consciousness in three dimensions requires connection to the 4+ dimensional quantum field (unified field theory) via pi electron resonance clouds contained in hydrophobic pockets within the tubulin protein molecules that comprise microtubules inside neurons that, in turn, form gap junction mediated hyperneuronal structures in the CNS.

The Basic Theory

- Royal Smart People:



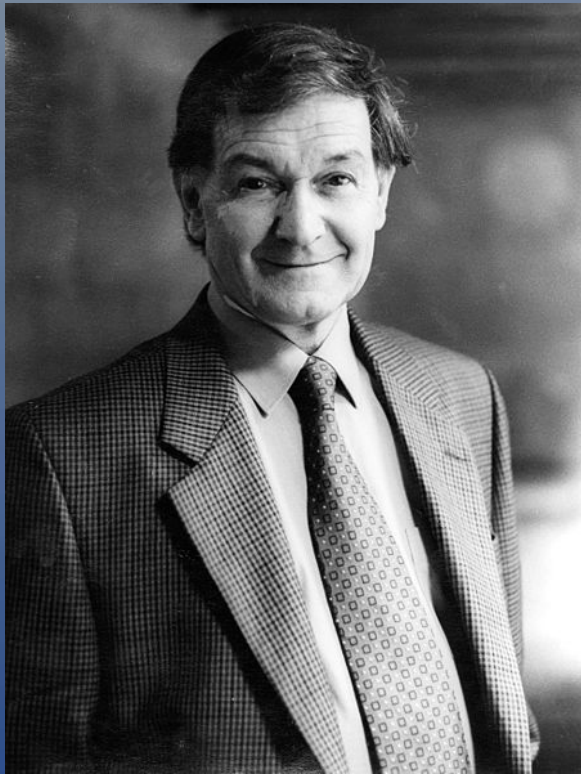


Orch OR Theory of Quantum Consciousness

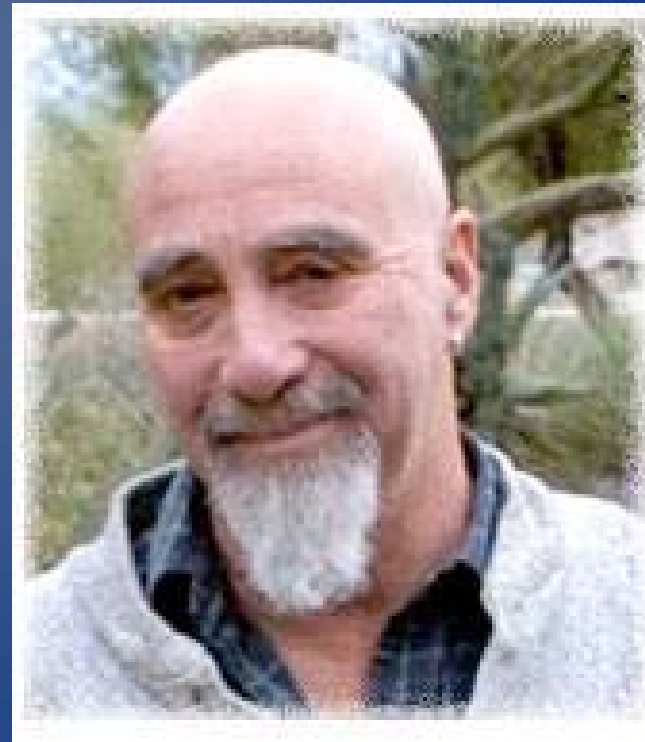
The Basic Theory

The Royal Smart People:

Sir Roger Penrose



Dr. Stuart Hameroff



Definition of Quantum

What is Quantum ?

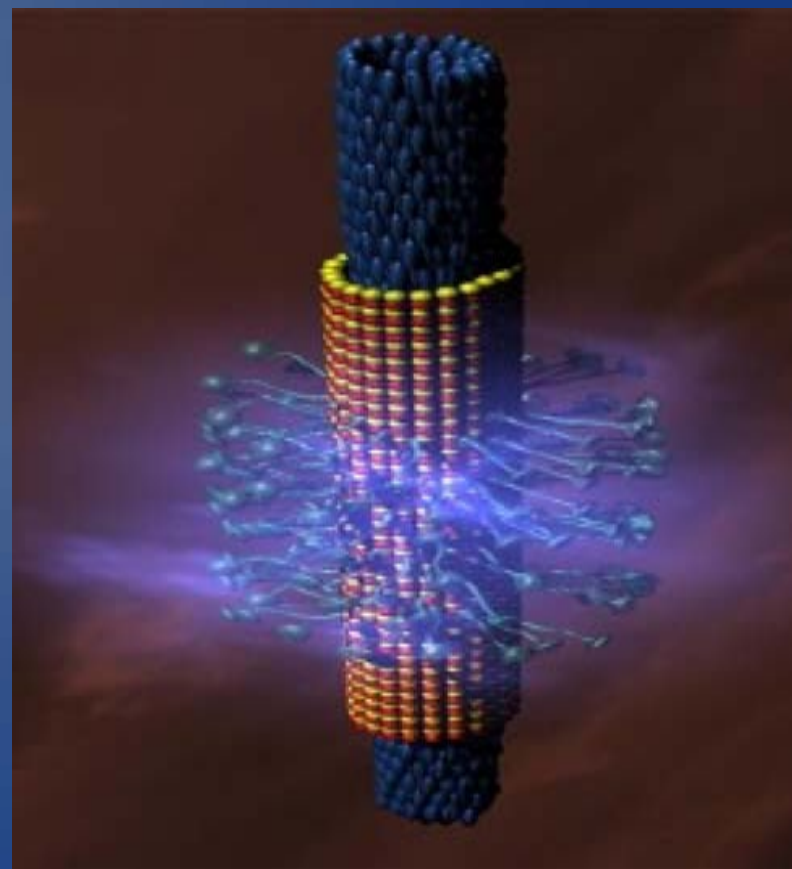
- Quantum torpedoes from Star Trek ? Not !!!
- Discrete bundles of energy and fixed states – nothing in between is allowed – think photons and/or electron orbitals (clouds)
- Uncertainty rules at scales of the very tiny – you absolutely cannot know or predict
- Probability rules at macroscopic scales
- Time travel – an electron moving forward in time is synonymous with a positron moving backward in time
- Classically, decoherence occurs via observation, but Penrose proposes Objective Reduction or self-decoherence ← key to this theory



The Basic Theory

- Not Enough Neurons and/or Connections using classical neuroanatomic models
- Qualia not explained by invocation of computational algorithms – Quantum functions needed
- Information capacity of Microtubules is huge but only part of consciousness
- The Brain as a Bell's Measurement machine

Microtubule with Water and C-terminal Tails

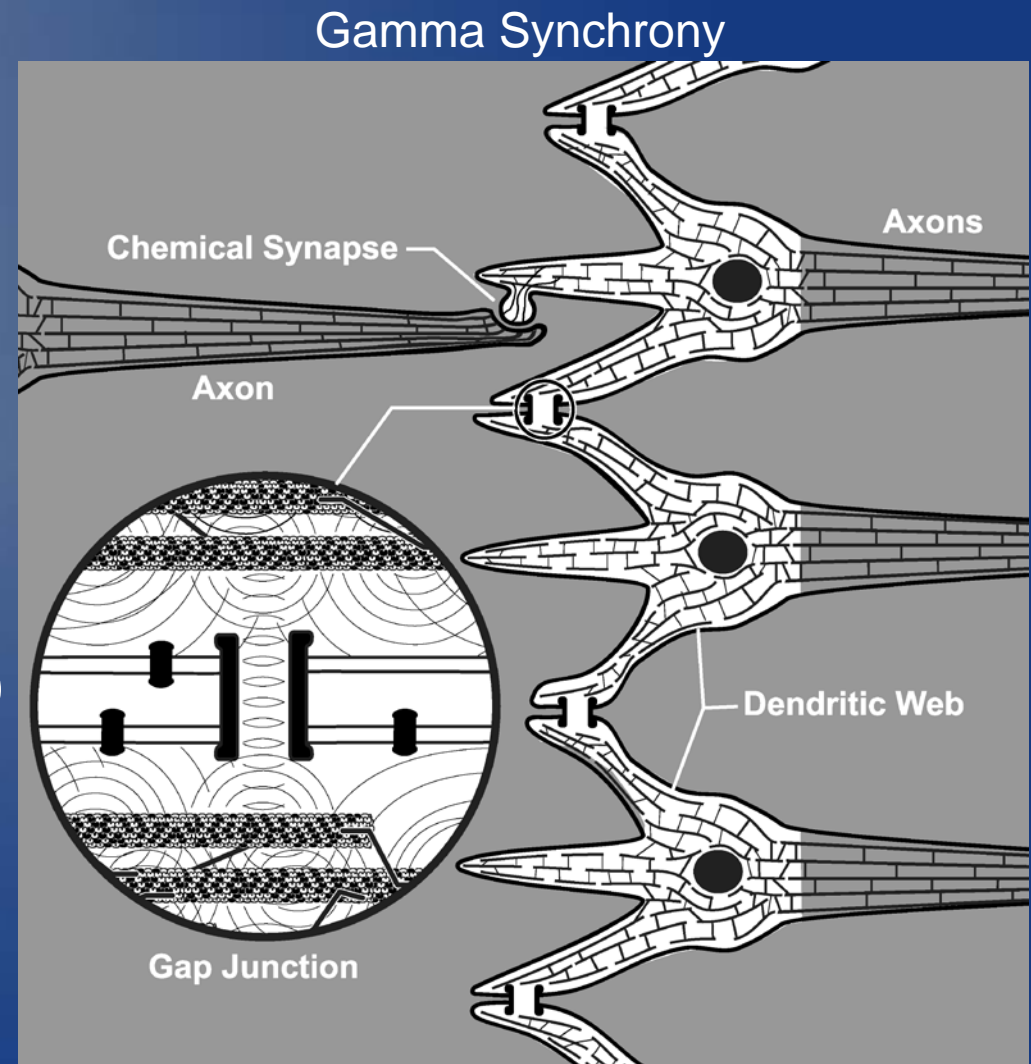


(Hameroff, 2011)

The Basic Theory

Gamma Synchrony

- Devoid of linear propagation delays
- “Dendritic–dendritic gap junctions form a laterally connected input layer (dendritic web) within a neurocomputational architecture” (Hameroff, 2007)
- Think about the firing of the SA node and propagation through Bundle of His-->AV node



(Hameroff/Cognitive Science, 2007)



Some Quantum Physics

What is Reality ???

- Define Reality for Humans ???
- Human limitations
 - No capacity to perceive more than 3 dimensions
 - Our 5 senses only
 - 6th sense not quantifiable using objective linear processes
 - Brain fake out – examples:
 - A) stereoscopic vision with one eye closed
 - B) 3D perceived from 2D pictures
 - C) Time : humans are terrible time keepers

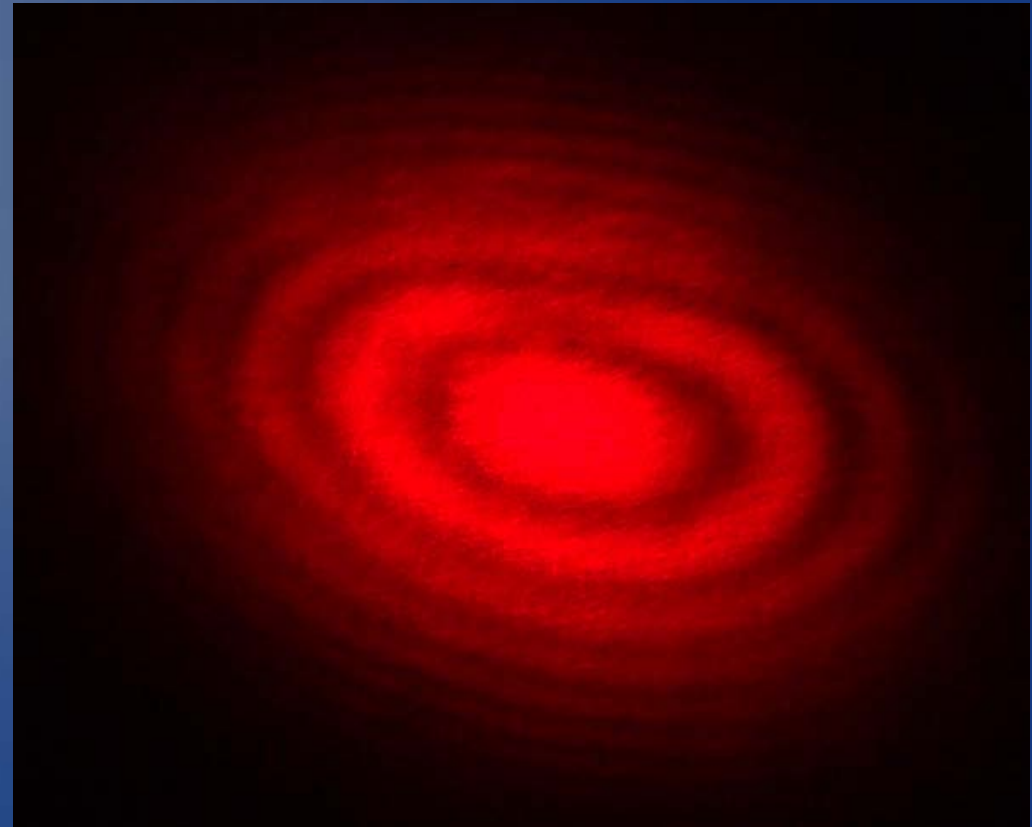


Some Quantum Physics

Quantum Reality

- A quantum entangled sea of possibilities at the Planck scale (Planck's constant = $6.626068 \times 10^{-34} \text{ m}^2 \text{ kg} / \text{s}$)
- Coherence : all possibilities in superposition and form an interference pattern (quantum wave functions)
- Decoherence : all possibilities collapse into a single highly probable outcome (or not) upon observation \rightarrow reality

Interference pattern produced with a Michelson Interferometer



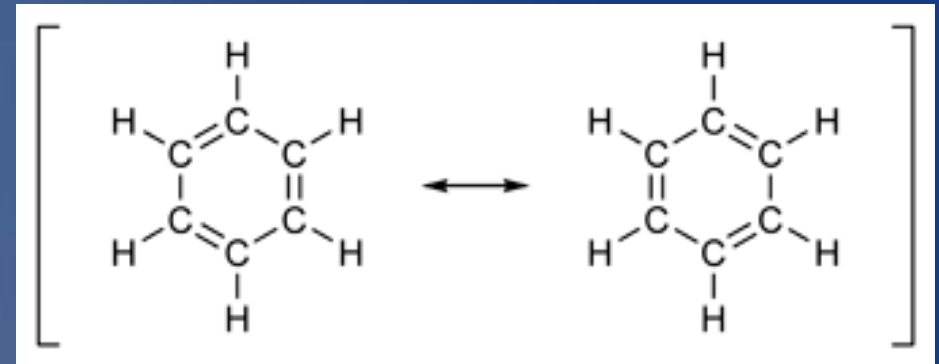
(Michelson, n.d.)

Quantum Structures in the CNS

Pi Electron Resonance Clouds

- Benzene model used for simplicity (really a phenyl group in the tubulin protein)
- Pi electron is the one that is shared
- Statistical probability of electron location at any given time (a quantum function)
- Forms Quantum Qbit – either state or both simultaneously
- Burger model – think a Picasso bun for the phenyl molecule

Benzene Resonance(used for simplicity)



(Wikipedia, n.d.)



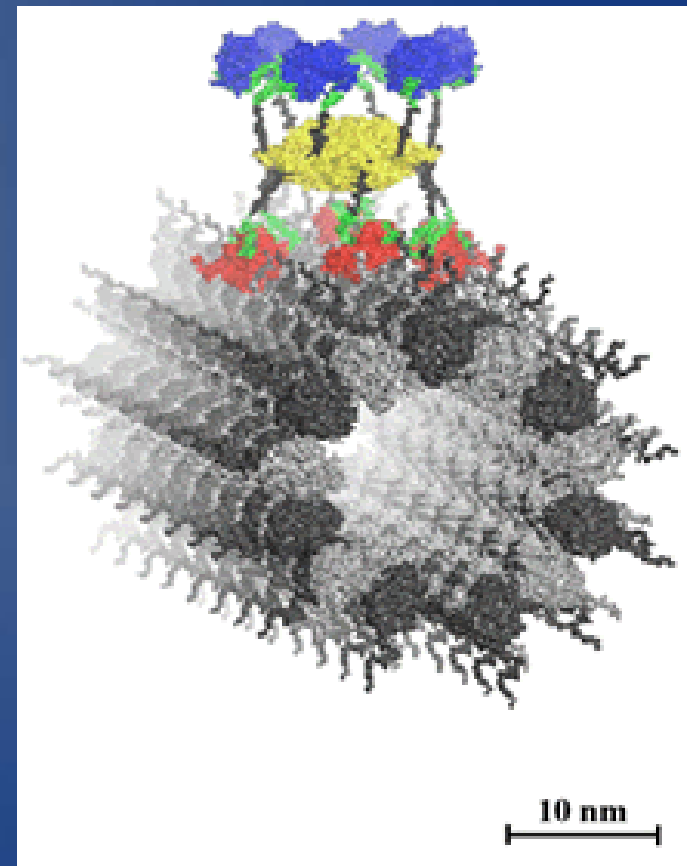
(Photosearch.com, n.d.)

Quantum Structures in the CNS

Pi Electron Resonance Clouds

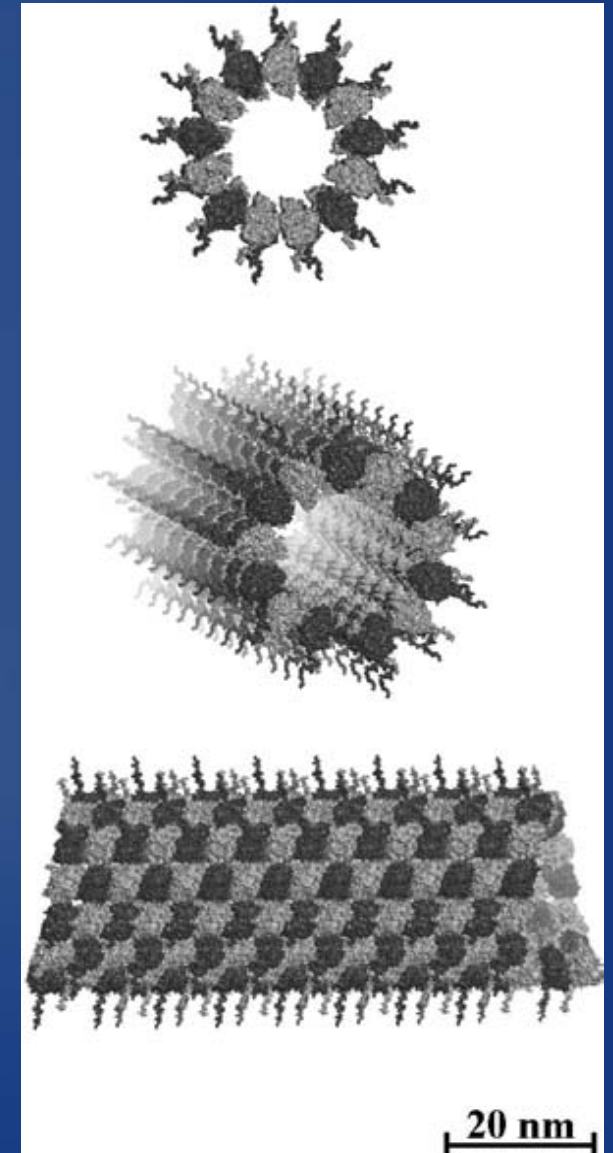
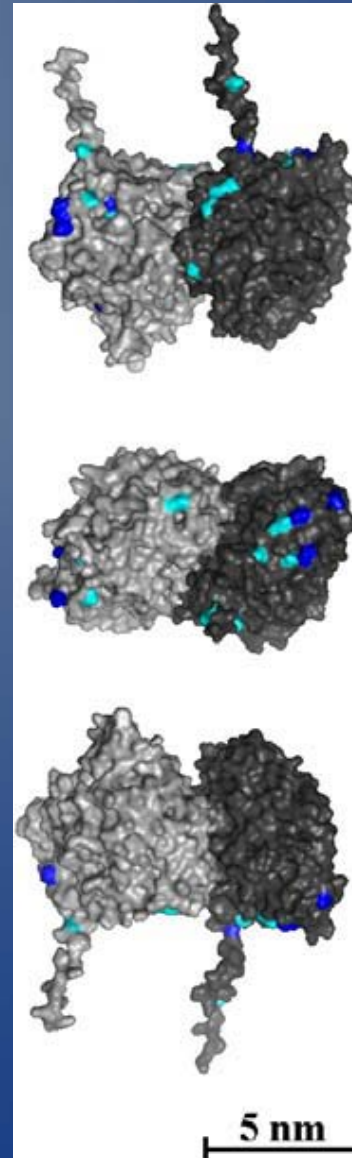
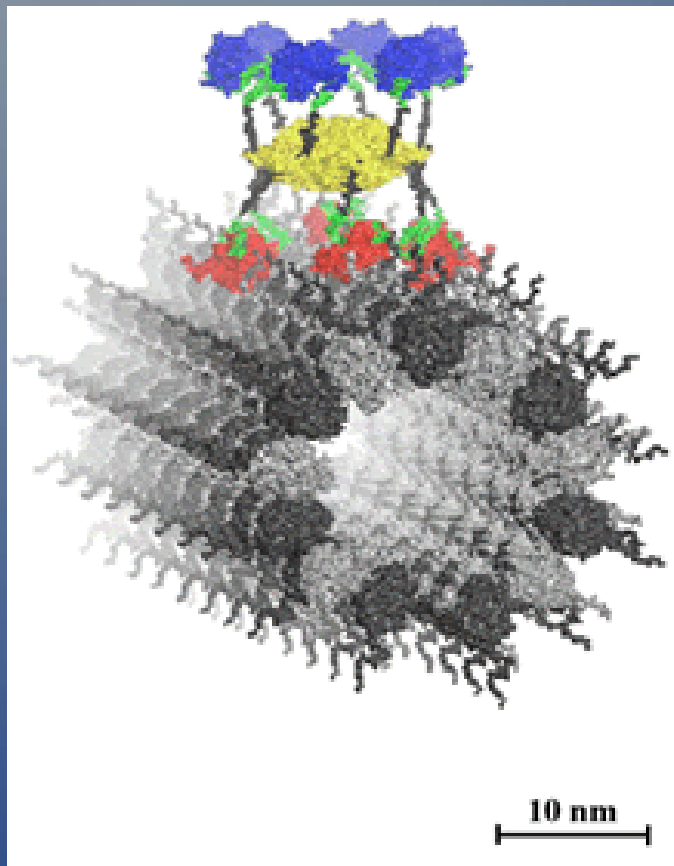
- Typically 6 resonant phenyl groups form a hydrophobic pocket
- Allosteric disruption of resonance cloud arrays via induced van der Waal forces from anesthetic gases disrupts consciousness
- Similar disruption by psycho active drugs alters consciousness

Memory Bytes in Microtubules



(Journal of Integrative Neuroscience, 2011)

Quantum Structures in the CNS

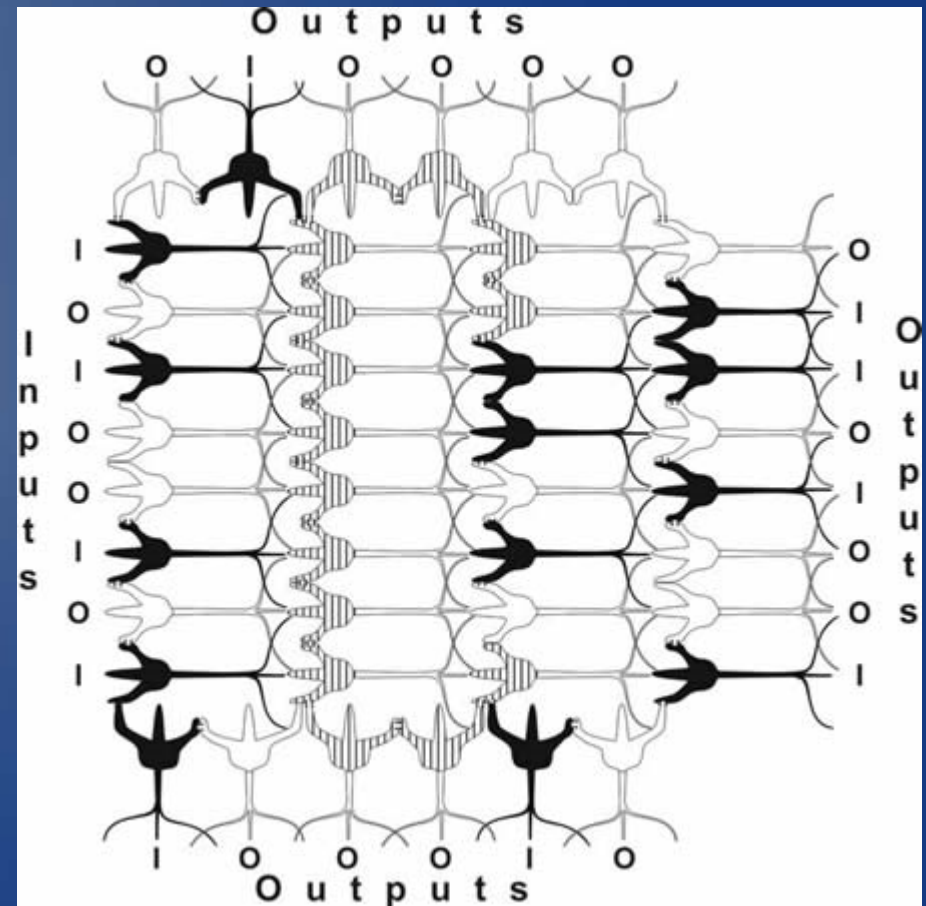


All graphics with permission
(Hameroff, Craddock, and Tuszinski, 2011)

Mechanics of Quantum Computation

- Typical Black Box theory
- Information is already in the quantum field
- Hyperneurons achieve quantum isolation via polarity of water assisted by negatively charged C-termini tails on the tubulin molecules (Hammeroff, 2010)
- Self-decoherence occurs at 40Hz (Penrose, 1989) resulting in copying of quantum information (Reiper, 2010)
- BING !! A conscious event is formed. Consciousness is a movie at 40 frames per second.

Neuronal Black Box Multiplexor



(Ebner & Hameroff, 2009)

Arguments Against Orch OR

- Most arguments have failed to follow the theory
 - Testing tubulin proteins in sheets rather than in naturally occurring tubules
 - Graphics of Qbit formation are wrong, not the theory
- Decoherence slow enough to accommodate observed millisecond timing of hyperneuron isolation (decoherence of macroscopic structures is typically measured in femtoseconds or 10^{-16} seconds)

Implications

- Entirely new way of measuring development, with a new set of developmental milestones
- Hameroff versus Varcarolis : Entirely new way to analyze anesthetics and psychoactive drugs – quantum effect, rather than classical neurotransmitter and/or receptor theory models
- Nursing : entirely new form of human interconnectedness – at the quantum level.

Orch OR Theory of Quantum Consciousness

Got It Yet ???

Q & A