
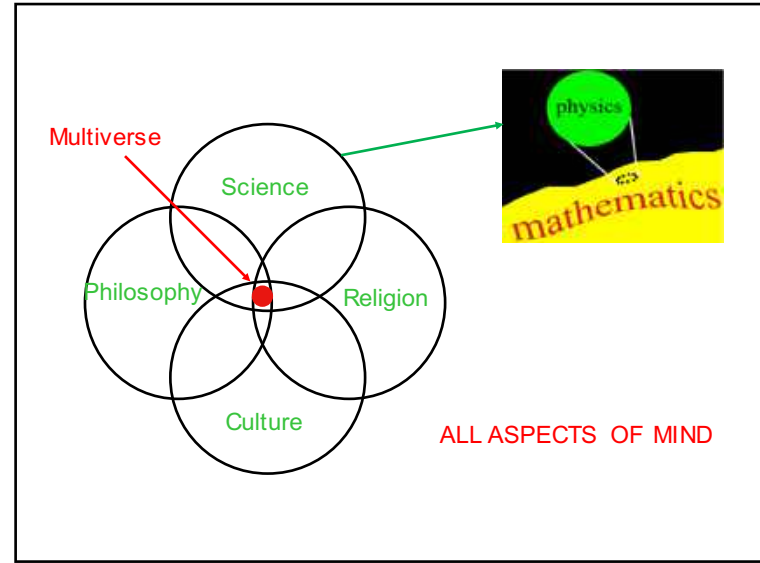


IS THE MULTIVERSE IN THE MIND
OR IS THE MIND IN THE MULTIVERSE?



Bernard Carr
Queen Mary University of London
Pari Center 23 October 2021



MULTIVERSE IN PHILOSOPHY

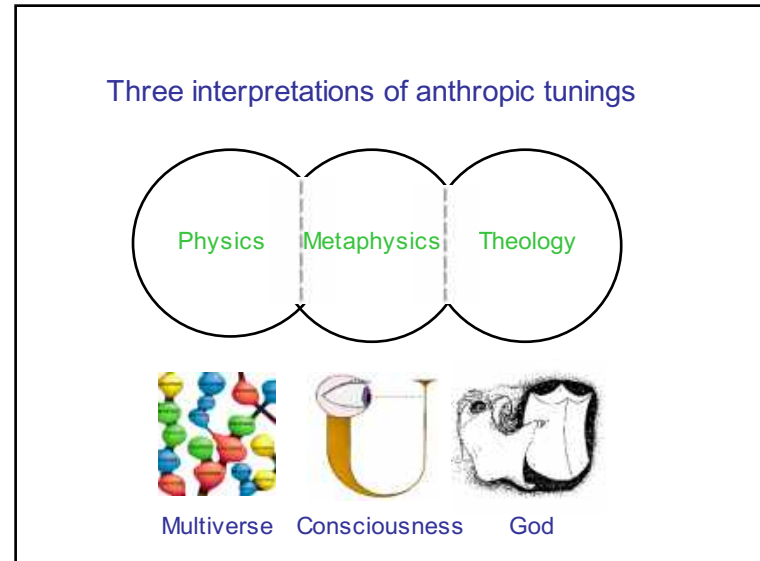
"Visible nature is all plasticity and indifference, a multiverse, as one might call it, and not a universe." William James, *The Will to Believe* (1895)

.....AND RELIGION

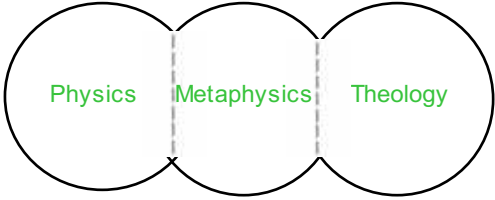

"There are innumerable universes besides this one, and although they are unlimitedly large, they move about like atoms in You. Therefore You are called unlimited." Bhagavata Purana 6.16.37

Fakhr al-Din al-Razi (1149–1209) in the *Matalib* raises the question of whether the term "worlds" in a Qur'anic verse refers to multiple worlds within this single universe or to many other universes beyond the known universe.

"He the Most High has the power (*qadir*) to create a thousand thousand worlds (*alfa alfi 'awalim*) beyond this world such that each one of those worlds be bigger and more massive than this world, as well as having the like of what this world has of the heavens (*al-samawat*) and the earth (*al-ard*) and the sun (*al-shams*) and the moon (*al-qamar*). The arguments of the philosophers (*dala'il al-falasifah*) for establishing that the world is one are weak, flimsy arguments founded upon feeble premises."

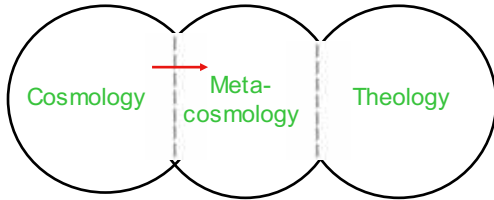


But opinions of boundary differ - boggle threshold!

Self-creation



But cosmology/metacosmology boundary is fuzzy and evolves




Yesterday's metacosmology is today's cosmology.
 Today's metacosmology is tomorrow's cosmology.

History of cosmology => continual transition in domain of science

OTHER EXAMPLES OF METACOSMOLOGY


- Boltzmann's brain 
- Passage of time 

The nature of legitimate science changes



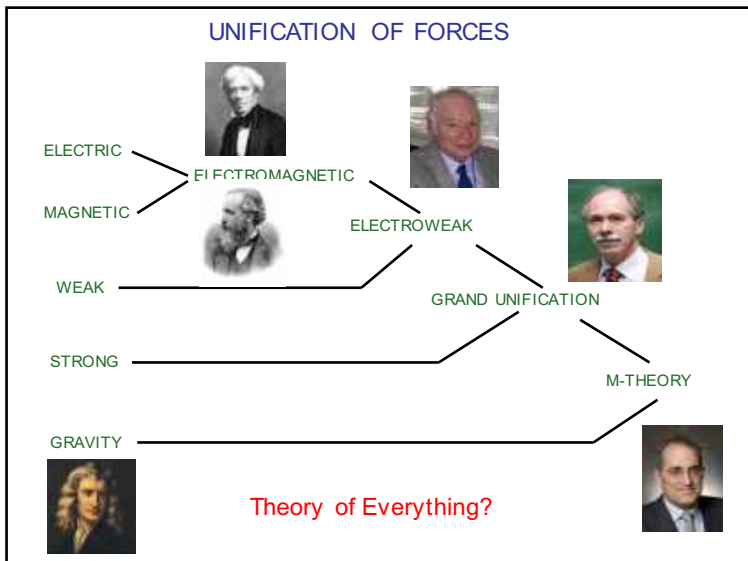
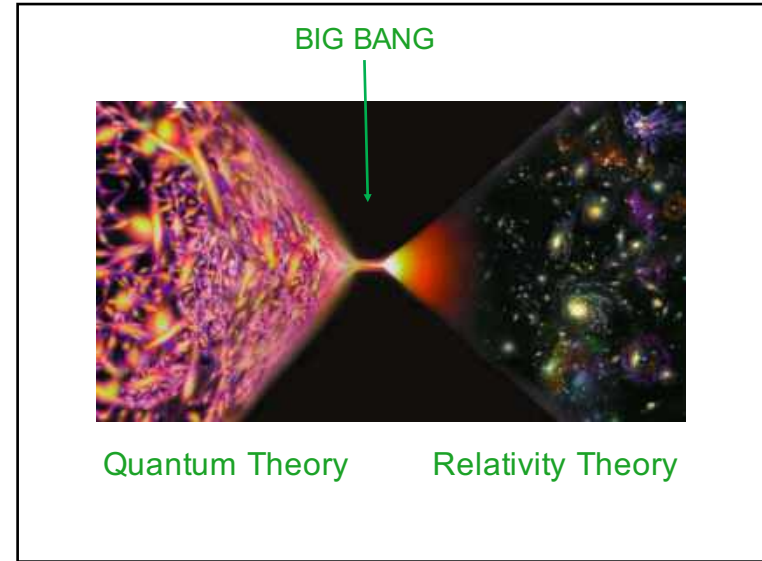
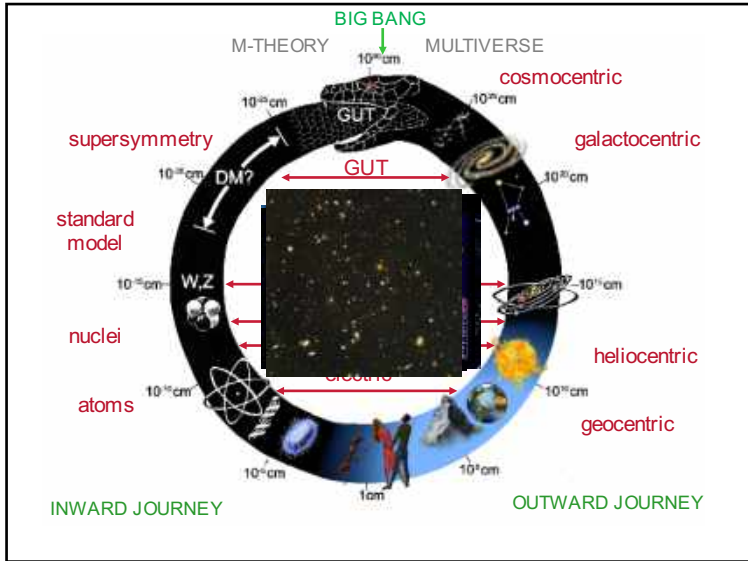
We usually mark advances in the history of science by what we learn about nature, but at certain critical moments the most important thing is what we discover about science itself. These discoveries lead to changes in how we score our work, in what we consider to be an acceptable theory.

Steven Weinberg



Such ideas may sound wacky now, just like the Big Bang theory did three generations ago. But then we got evidence and it changed the whole way we think about the universe.

George Efstathiou



The completion of the Cosmic Uroborus represents the triumph of physics.....but also poses a dilemma

M-theory

Multiverse

Defend the integrity of physics

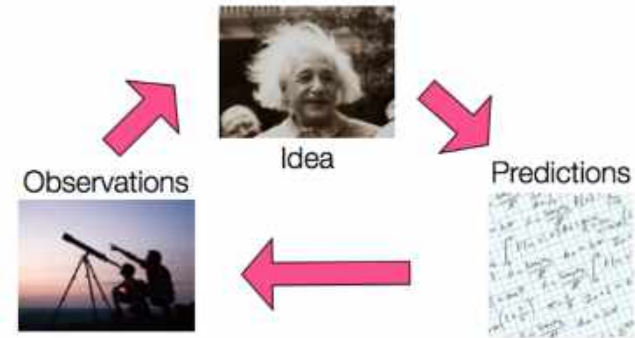
Attempts to exempt speculative theories of the Universe from experimental verification undermine science, argue **George Ellis** and **Joe Silk**.

Ellis & Silk, Nature (2015)

WHAT IS SCIENCE?

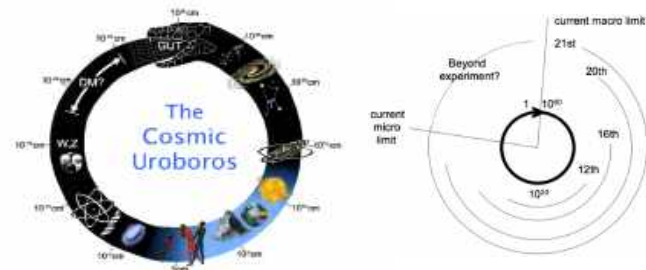
- * Experimentation (not for stars and galaxies)
- * Large sample (not for universe)
- * Observation (not for black hole or quarks or multiverse)
- * Falsification (Popper out of fashion)

THE NATURE OF SCIENCE



What is the timescale of each of these steps?

EVOLVING NATURE OF SCIENCE




- Scientific progress => expansion of knowledge to larger and smaller scales
 - Nature of science changes as it progresses and addresses new questions
 - Micro and macro frontiers have always been on physics/metaphysics border
- Merger of micro/macro frontiers => end or transformation of science?

The triumph of mindlessness!



Is mind fundamental not incidental to universe?




Stephen Hawking finds Theory of Everything

.....enjoyable!


ARGUMENTS FOR SIGNIFICANCE OF MIND

- Comprehensibility of Universe




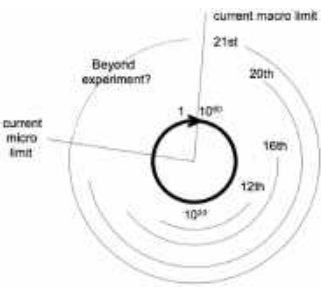
The Universe is more like a great thought than a great machine (James Jeans)

- Beauty of Universe



It is more important to have beauty in one's equations than to have them fit experiment.

UROBORUS AS EXPANSION OF MIND

Paradigm shifts give a sequence of mental models


=> multiverse is also in the mind!

IS CONSCIOUSNESS FUNDAMENTAL?


NO

YES


"The time seems to have come when psychology must discard all reference to consciousness; when it need no longer delude itself into thinking that it is making mental states the object of observation."
John Watson (1913)



Consciousness as fundamental
"I regard consciousness as fundamental. I regard matter as derivative from consciousness. We cannot get behind consciousness. Everything that we talk about, everything that we regard as existing, postulates consciousness."
~ Max Planck
the founder of quantum mechanics
Nobel Prize, Physics, 1918
1858-1927



"Consciousness appears to be the last bastion of occult properties, epiphenomena and immeasurable subjective states - in short, the one area of mind best left to philosophers, who are welcome to it. Let them make fools of themselves trying to corral the quicksilver of phenomenology into a respectable theory."
Daniel Dennett (1991)







Consciousness as fundamental
"I propose that conscious experience be considered a fundamental feature, irreducible to anything more basic...."
~ David J. Chalmers
mathematician, philosopher



ANTHROPIC PRINCIPLE

Q: What counts as an observer?


- A human? 
- A mouse? 
- A robot? 
- A photon? 

Is consciousness crucial?


Tegmark

IS CONSCIOUSNESS RELEVANT TO PHYSICS?


"It is not possible to formulate the laws of physics in a fully consistent way without reference to the consciousness of the observer."
Eugene Wigner (1957)




"Mind and Universe are complimentary"
John Wheeler (1977)



"Physics must expand to explain mental experiences"
Noam Chomsky (1975)



"The doctrine that the world is made up of objects whose existence is independent of human consciousness turns out to be in conflict with quantum mechanics and with facts established by experiments."
Bernard d'Espagnat (1983)

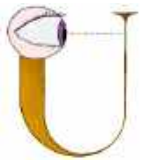



QUANTUM THEORY AND MIND

Eugene Wigner
Consciousness collapses wave function

Henry Stapp
Observer selects quantum possibility

David Bohm
Implicate order underlies explicit order of physical world






But quantum theory cannot *explain* mind

Physics cannot explain consciousness

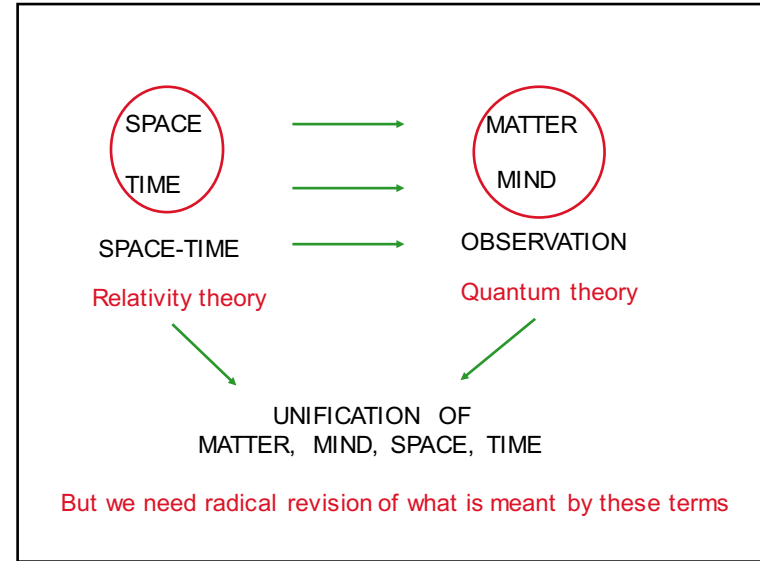
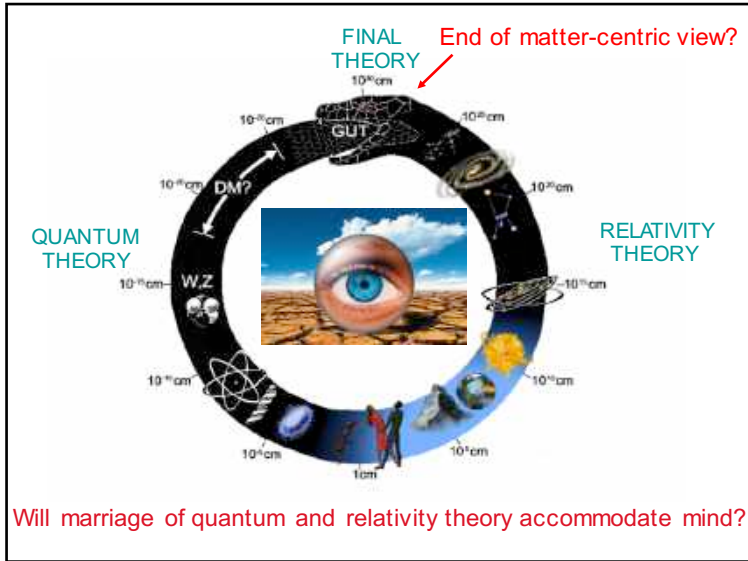
"My position [on consciousness] demands a major revolution in physics.... [T]here is something very fundamental missing from current science. Our understanding at this time is not adequate and we're going to have to move to new regions of science...."



~ SIR ROGER PENROSE
mathematical physicist

Sir Roger Penrose. Quoted in: Karl Giberson. The man who fell to earth. Interview with Sir Roger Penrose. *Science & Spirit*. March/April 2003: 34-41.

=> deeper model underlying *both* quantum theory and mind



IS CONSCIOUSNESS GENERATED BY THE BRAIN?

How could consciousness possibly arise from the physical brain?

"Beats the heck out of me. I have some prejudices, but no idea of how to begin to look for a defensible answer. And neither does anyone else."

~ Steven Pinker
experimental psychologist
Harvard University

Steven Pinker, *How the Mind Works*. New York, NY: W. W. Norton, 1997, 146.

"The scientific study of consciousness is in the embarrassing position of having no scientific theory of consciousness."

~ Donald Hoffman
cognitive scientist
U. California-Irvine

Donald Hoffman, *Consciousness and the mind-body problem*. Mind & Matter, 2006, (3), 87-121.

"Nobody has the faintest idea what consciousness is.... I don't have any idea. Nor does anybody else, including the philosophers of mind."

~ Stuart Kauffman
theoretical biologist
& complex systems theorist

Stuart Kauffman, *At Home in the Universe: The Search for Life's Self-Organizing Principle*. Oxford: Oxford University Press, 2000, 84.

"The origin of life is a total mystery, and so is the existence of human consciousness. We have no clear idea how the electrical discharges occurring in nerve cells in our brains are connected with our feelings and desires and actions."

~ Freeman Dyson
physicist

Freeman Dyson, *How we know*. The New York Review of Books, March 10, 2011, (16), 8-13.

EVIDENCE FOR NON-LOCAL MIND

"It may be that our deep interconnectedness with each other and with all of Nature is the major conclusion that issues forth from the many findings of [consciousness research]."

~ William G. Braud
consciousness researcher

1942-2012

Creativity and discovery in science.

"People say I have created things. I have never created anything. I get impressions from the Universe at large and work them out, but I am only a plate on a record or a receiving apparatus.... Thoughts are really impressions that we get from outside."

~ Thomas Alva Edison

Neil Baldwin, *Edison: Inventing the Century*. NY: HarperCollins, 1999, 275.

1847-1931

"My symphony will be something that the world has never heard before! ...I tell you, at certain places in the score, a quite uncanny feeling takes possession of me, and I feel as if I had not created this myself."

~ Gustav Mahler
composer

1860-1911

(in a letter to a friend about his Third Symphony, 1896)

"[T]he borders of our minds are ever shifting, and ... many minds can flow into one another... and create or reveal a single mind, a single energy.... [T]he borders of our memories are ... shifting, and ... our memories are part of one great memory...."

~ William Butler Yeats


1865-1939

W.B. Yeats, *Quoted in: Poetry 1900, Jack Wills at the National Gallery, UK, London: York University Press, 2000, 84.*


This suggests Universal Mind

"There is one mind common to all individual men... [a] universal mind..."

~ Ralph Waldo Emerson
essayist, philosopher




1803-1882



"Deep down the consciousness of mankind is one. This is a virtual certainty... and if we don't see this it's because we are blinding ourselves to it."

David Bohm
physicist




1917-1992

and brain as filter

"[E]ach one of us is potentially Mind at Large. But in so far as we are animals, our business at all costs is to survive. To make biological survival possible, Mind at Large has to be funneled through the reducing valve of the brain and nervous system."

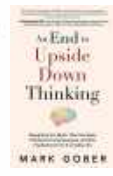
~ Aldous Huxley
The Doors of Perception



Aldous Huxley
1894-1963

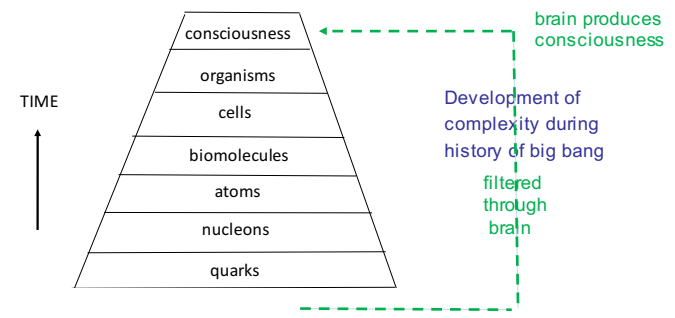
"Less brain, more consciousness"

- Near-death experiences (NDEs)
- Psychedelics
- Savant syndrome
- Terminal lucidity



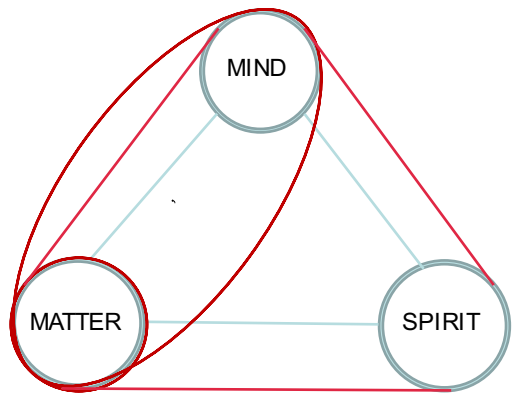
MARK GOREN

PYRAMID OF COMPLEXITY



The diagram shows a pyramid with levels from bottom to top: quarks, nucleons, atoms, biomolecules, cells, organisms, and consciousness. To the left, an upward arrow is labeled 'TIME'. To the right, a dashed green line indicates that complexity is 'filtered through brain' and 'brain produces consciousness'.

HOW FAR CAN SCIENCE BE EXTENDED?



Science assumes world is governed by *laws* discernible by observations (inner or outer) and formulated mathematically.


We need
A NEW PARADIGM
which incorporates...

- * consciousness
- * transcendence of space and time
- * mental phenomena in some radically new way

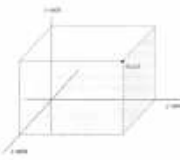

GRAND UNIFIED THEORY OF MATTER AND MIND

... which involves higher dimensions!

NEWTONIAN VIEW




Arena of physical reality is 3D space.... and time

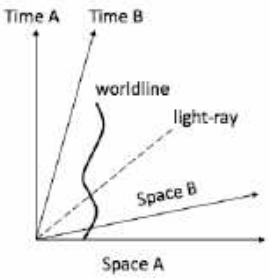
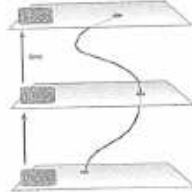



Both space and time are absolute

EINSTEIN VIEW



Arena of physical reality is 4D spacetime


Time is 4th dimension Worldline

HIGHER DIMENSIONS IN PHYSICS

Kaluza-Klein (1926): 5th dimension unifies gravity and electromagnetism but is compactified on Planck scale

compactified extra spatial dimension

extra dimension invisible



three extended spatial dimensions →

→


→

NEAR VIEW

FAR VIEW

Superstrings (1984): six compactified dimensions => 10D

M-theory (1995): seven compactified dimensions => 11D



Physics gives sequence of paradigms with increasing dimensionality

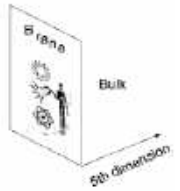
11D M-theory

10D superstrings

5D Kaluza-Klein

4D Einstein

3D Newton

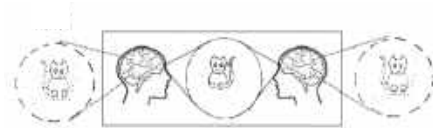


This is the price of UNIFICATION!

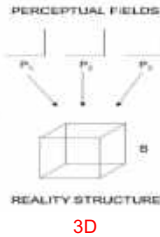
Randall-Sundrum: 4D brane in higher-dimensional bulk

WHAT IS THE NATURE OF REALITY?

Percepts associated with external (physical) reality in standard view

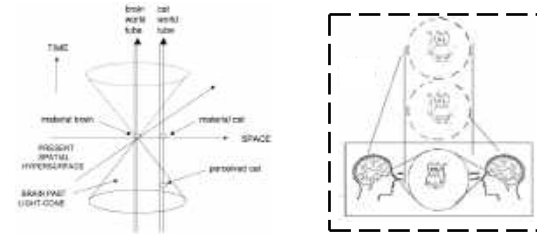


There exists 3D space in which are localized both physical objects and sensors through which we observe objects. Each observer has only partial information about this space but there exists a 3D configuration which gives 2D projection concordant with those presented. Reality is 3D structure which consistently reconciles our perceptions of it.



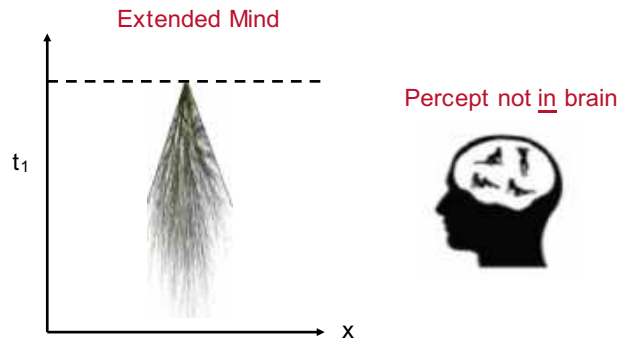
MODIFIED MODEL OF REALITY

Relativity theory implies that physical world is 4D, with the objects and observers being represented by world-lines and perceptual fields being 3D. Physical reality is 4D structure which consistently reconciles our perceptions of it.



3D view: 3D object → 2D percept
4D view: 4D object → 3D object + 3D percept

SPACETIME OUTLOOK TREE



Phenomenal space is part of spacetime connected to brain by causal signalling network, including neuronal process.

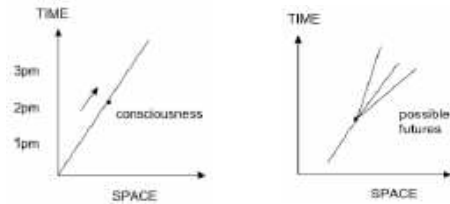
Object and brain are just two ends of a 4-dimensional chain

TIME AND MIND: TWO PROBLEMS



- Flow of time
- Specious present

CONSCIOUSNESS AND THE FLOW OF TIME



Einstein "block universe" does not describe flow of time*

Relativity merges space and time but spacetime is frozen.

* or the collapse of the wave function

Weyl: No objective passage



Hermann Weyl (1949)
The objective world *is*, it does not *happen*. Only to the gaze of my consciousness, crawling upward along the life-line of my body, does a section of this world come to life as a fleeting image in space which changes in time.

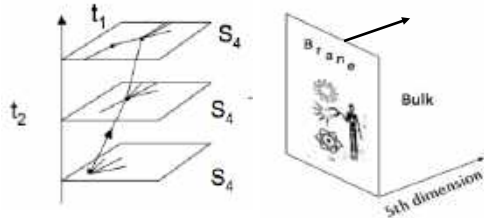
Einstein: No privileged present



Einstein's letter to family of Michele Besso (1955)

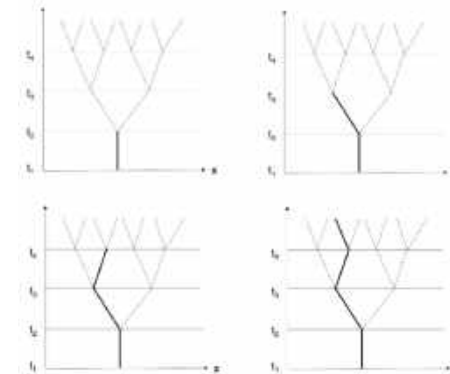
"Now he has departed from this strange world a little ahead of me. That means nothing. People like us, who believe in physics, know that the distinction between past, present and future is only stubbornly persistent illusion"

C.D. Broad



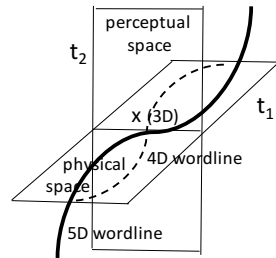
Extra dimension (t_2) can describe time flow

One version of M-theory views the physical world as a 4D brane moving through a 5D bulk, so this may elucidate an old philosophical problem.



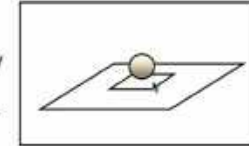
(cf. many worlds?)

5-DIMENSIONAL PSYCHO-PHYSICAL SPACE



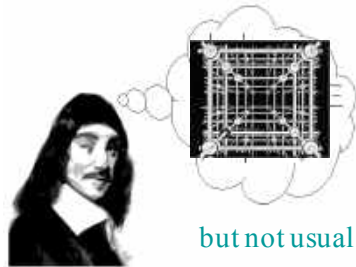
Higher dimensional mind/brain intersection

- Flatland: analogous to our (3+1)-D spacetime (empirical) realm
- The Sphere pokes the Square in his 'stomach'
- Every lower-dimensional space is 'internally open' to intersection with elements of a higher-dimensional space
- Fellow Flatlanders would view the Square's reported sensations/experiences as delusional, or at least as not 'scientific' — because not subject to empirical corroboration *at their level!*
- But of course even our experience that we are conscious and thinking is not empirically verifiable (Martin Pistorius, survivor of "Locked-in Syndrome")
- Embedding of empirical realm in larger, sub-empirical (quantum) realm provides ontological basis for internal experiences of subjective awareness, 'intuitive' perceptions of a higher reality as expressed in spiritual and psychological domains



Ruth's slide

WE NEED SPACE AND TIME FOR MIND



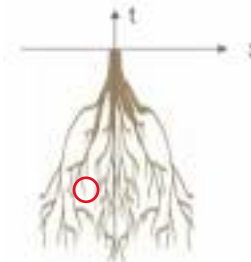
but not usual space and time

Universal Structure = higher dimensional reality structure with both normal and 'anomalous' mental phenomena.

MEMORY SPACE

Usual View. Memories are generated by brain and derive from physical world. Experiences are **internal** (i.e. inside the head).

Alternative View. Memories of physical events reflect direct access of consciousness to spacetime which contains the events. Experiences are **external** (i.e. the part of spacetime connected to the brain by nexus of signalling worldlines).



Is memory a re-experiencing of past (tag or trace)?

DREAM SPACE



Price (1955) proposes that physical events and dream events exist in different spacetimes

"We inhabit two worlds simultaneously, the world of common experience governed by physical law and another space, quite as real, which obeys other laws....continuous dream-life goes on throughout our waking hours and occasionally we may catch a glimpse of it."



Broad (1953) merges dream and phenomenal spaces into a single space of more than three dimensions in which sensations of all kinds exist

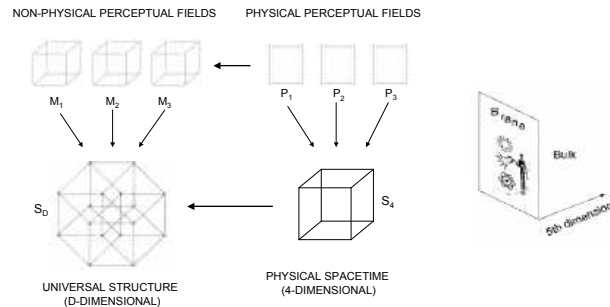
IS THERE A SPACE FOR ANOMALOUS EXPERIENCES?

- * *Threshold experiences*
Pseudo-physical on sleep/waking border, often associated with sleep paralysis
- * *Apparitions*
Hallucinations? Veridical? Collective cases? Physical trace?
- * *Out-of-body experiences*
Pseudo-physical? Clairvoyance? Higher planes?
- * *Near-death experiences*
Tunnel effect? Survival space? Memory Space?
- * *Mystical experiences*
Sense of unity, transcendence of space/time, deeper sense of reality
Need a space which is not the same as physical space but relates to it and unifies phenomenal space, memory space, dream space, ESP space and all these other spaces



UNIVERSAL STRUCTURE

Mental experiences can be accommodated in higher-dimensional reality structure reconciling our different experiences of the world. It has hierarchical structure and incorporates physical space, as well as non-physical parts accessed only by mind.



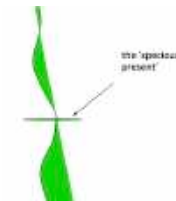
This is identified with the higher-dimensional space of Randall-Sundrum model, leading to "extended physics" which amalgamates physical and mental space.

SPECIOUS PRESENT

E. Robert Kelly [Clay] (1882)

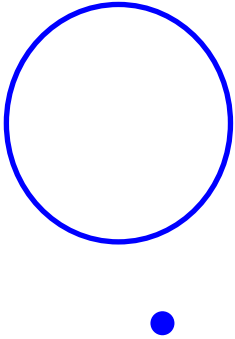
"The present is really a part of the [recent] past, delusively given as being a time that intervenes between past and future. Let it be named the Specious Present."

William James (1890) "The prototype of all conceived times is the Specious Present, the short duration of which we are immediately and incessantly sensible."



CONSCIOUSNESS AND SPECIOUS PRESENT
 Conscious time only exists between upper and lower limits

0.02 sec => 40 Hz



100 yr!

VARIATIONS IN SPECIOUS PRESENT

<i>Decrease</i>	<i>Increase</i>
Trapeze artist	Balance artist
Crisis	Fever
Tea time	NDE life review





MYSTICAL EXPERIENCE I.K.Yaimni "The Science of Yoga"

"There is interesting similarity between the description of mystical experiences produced through the stages of Samadhi characterised by Patanjali and an early anatomist twisting the focus of a microscope. It's as though the meditator is adjusting the focal length of his mind and encountering systematically different worlds depending on the settings achieved." (Ed Kelly)


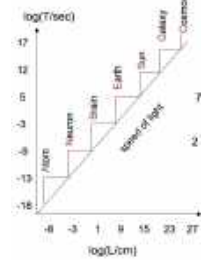
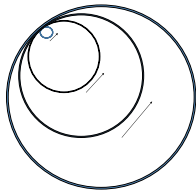

More dramatic changes of specious present?

SP may expand to infinity or shrink to zero!

Pure consciousness ("purusa") transcends space and time?




Compact extra dimensions => hierarchy of specious present


Mindahi slide

EVOLVING HIERARCHY OF CONSCIOUSNESS


increasing specious present




human 10^{-2} s



terrestrial 10^6 s



galactic 10^{16} s



cosmic 10^{17} s

WHY AM I ME?



AND NOT PAUL?





what she takes to be her body
is a **set** of bodies:



TIME AND SELF-IDENTITY

What is now?

Who am I?

Paul's slide

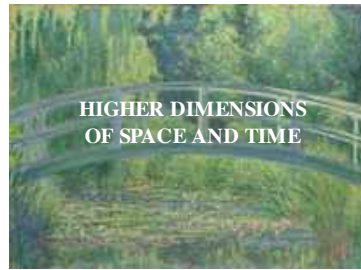
Separate identity only exists in lower dimensional space and is associated with just a narrow range of timescales.

CONCLUSION

Extended space and time plays crucial role in linking matter and mind and in relating experiment to experience.

Matter

Experiment



Mind

Experience

The multiverse of higher dimensions may be the most interesting