

THE VALLICO ACADEMY LECTURE SERIES

LECTURE FOUR

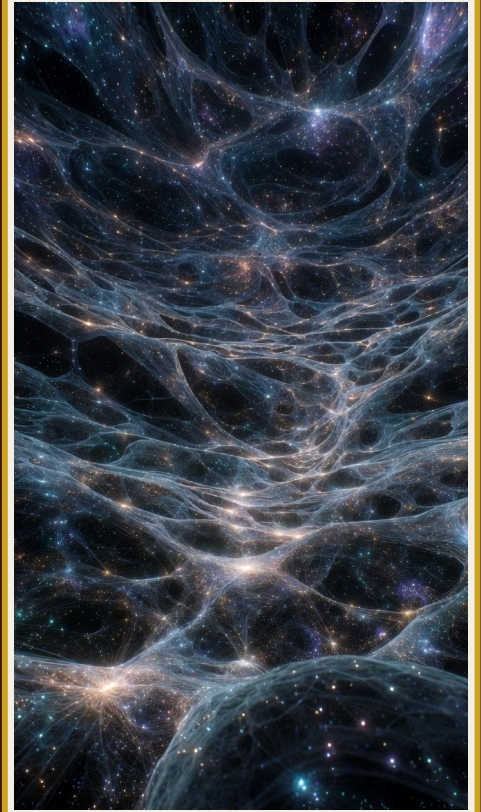
Local Brains, Universal Consciousness

*Orchestrated Objective Reduction vs. the de Broglie-Bohm
Panpsychist Cosmos*

*The question the equations kept circling: where mind sits in a universe of
matter.*



The Criminal Mind
Buenos Aires, circa 1890



10 ... 9 ... 8 ... 7 ...

nothing

Where did you go?

Two Ways of Paying Attention

THE FIRST MODE

Narrow. Grasping. Useful. Eats seeds. Takes things apart to measure them.



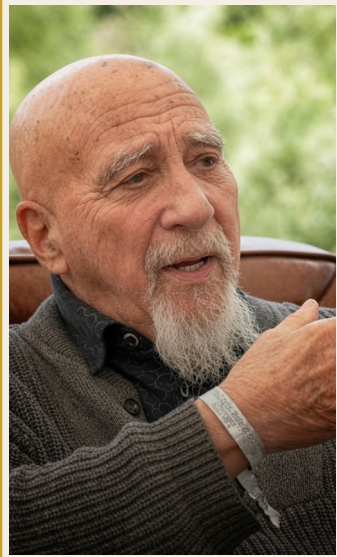
THE SECOND MODE

Broad. Open. Aware of potential danger. Holds things whole and lets them stay alive.



Three lectures, three roads: Burton, the buried tradition, the buried physics. Tonight they meet.

I Promised You Orchestrated Objective Reduction



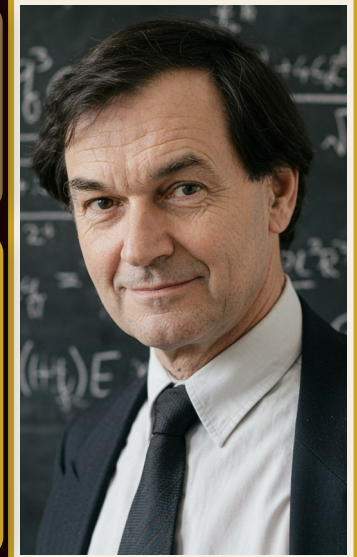
Stuart Hameroff

LECTURE THREE, CLOSING SLIDE

NEXT TIME: CONSCIOUSNESS IN THE EQUATIONS. Penrose · Hameroff · Orch-OR, and a suggestion for what the field might be.

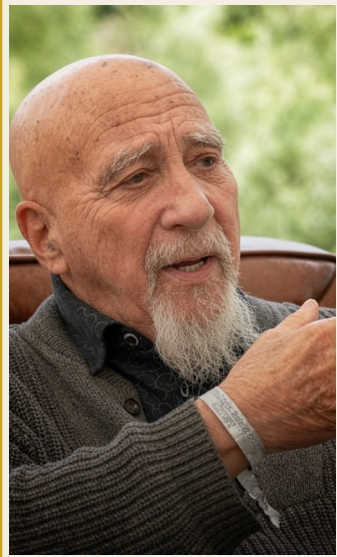
HOMEWORK

If we assume that the universal field, the One, 'God' if you're a pantheist is conscious, for some reason that at the moment we can't begin to understand, what would it be like to BE the undivided field?



Roger Penrose

I Promised You Orchestrated Objective Reduction

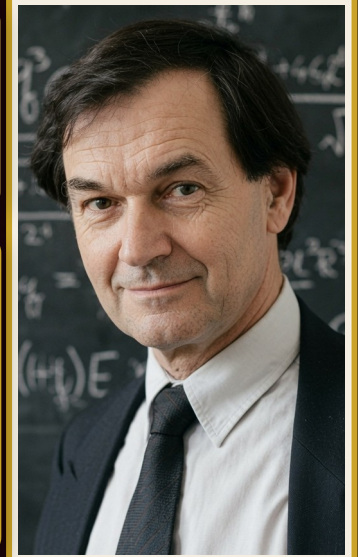


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THE OBJECTION

You have asserted five things and proved none of them.

The Hard Problem



DAVID CHALMERS

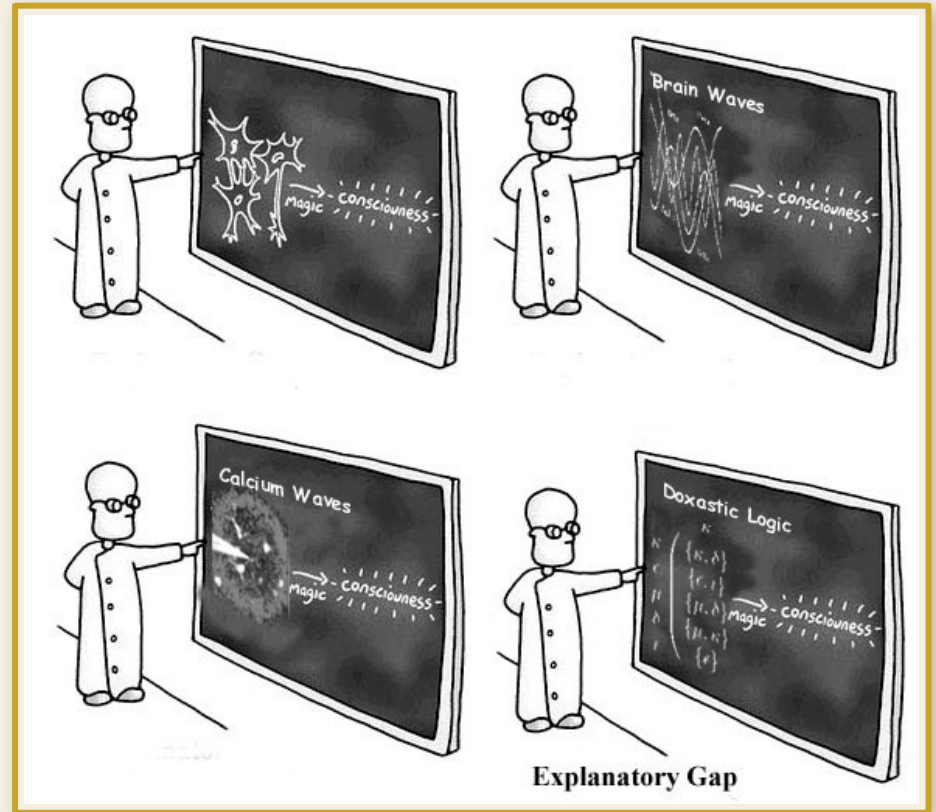
philosopher of mind

THE EASY PROBLEMS

How the eye detects light, how the brain moves a hand on command, how it tells waking from sleep. Hard engineering, ordinary science.

THE HARD PROBLEM

Why is any of it accompanied by experience? Why is the light on at all?



Provenance unknown.

The Person Next To You



THOMAS NAGEL

"What Is It Like to Be a Bat?", 1974



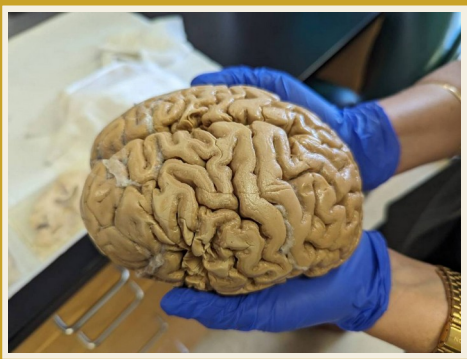
That inside-ness (qualia) is the datum science has no room for. Not hidden. Not merely unmeasured. Structurally absent from the account.

No quantity of description from the third person hands you the first.

Generator or Aperture

GENERATOR

Neurons fire; experience is produced, the way a fire produces heat. Switch off the brain, switch off the light.



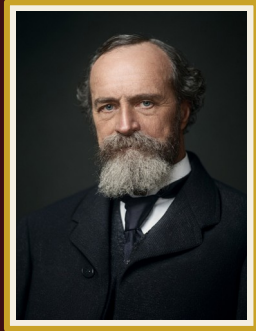
APERTURE

The brain receives and filters consciousness down to a trickle. A radio silenced is not the source of the music.



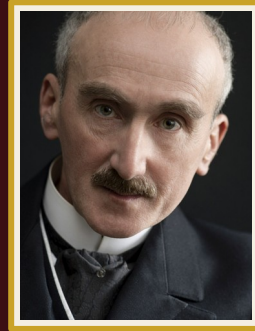
Damage the brain and the mind changes, on either story. The data does not choose for you.

A Valve On What?



WILLIAM JAMES
1842-1910

The brain may transmit consciousness, not produce it, like a prism transmits light it did not make.



HENRI BERGSON
1859-1941

The brain as an organ of attention to life. Its job: exclude the vast irrelevant everything.



ALDOUS HUXLEY
1894-1963

The reducing valve. The mystic, or the psychedelic, briefly opens it wider than is usually safe.

(AI-restored photographs.)

A valve is not a source. A valve on WHAT?

Mind All the Way Down

PANPSYCHISM

Mind as basic to matter as charge or mass is, rather than something switched on late in a skull. GALEN STRAWSON calls this the hard-headed physicalist position: physics describes behaviour and then stops. CHALMERS takes it seriously.

MICRO-PANPSYCHISM

Experience is a property of particles, and a mind must be built up out of them. → owes the combination problem: no account of how the building is done.

COSMOPSYCHISM

Experience is a property of the whole, and a mind is a region of it marked off. → nothing to build, so a different debt: why divide at all?



Pablo Carlos Budassi, Observable Universe Logarithmic Illustration. Cover art, Is Consciousness Everywhere?, eds. Goff and Moran.

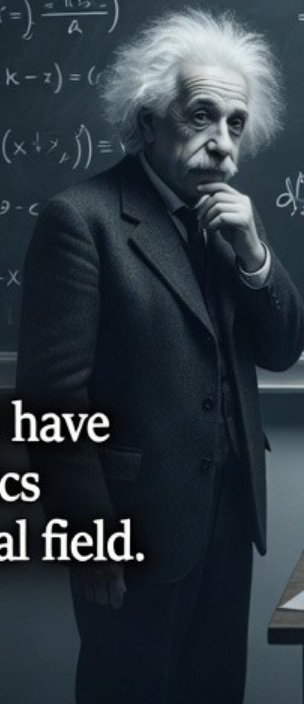
The universe is a complex system of interconnected parts, each with its own unique properties and functions. The universe is a complex system of interconnected parts, each with its own unique properties and functions. The universe is a complex system of interconnected parts, each with its own unique properties and functions.



The philosophers have
a universal field
with no mathematics.



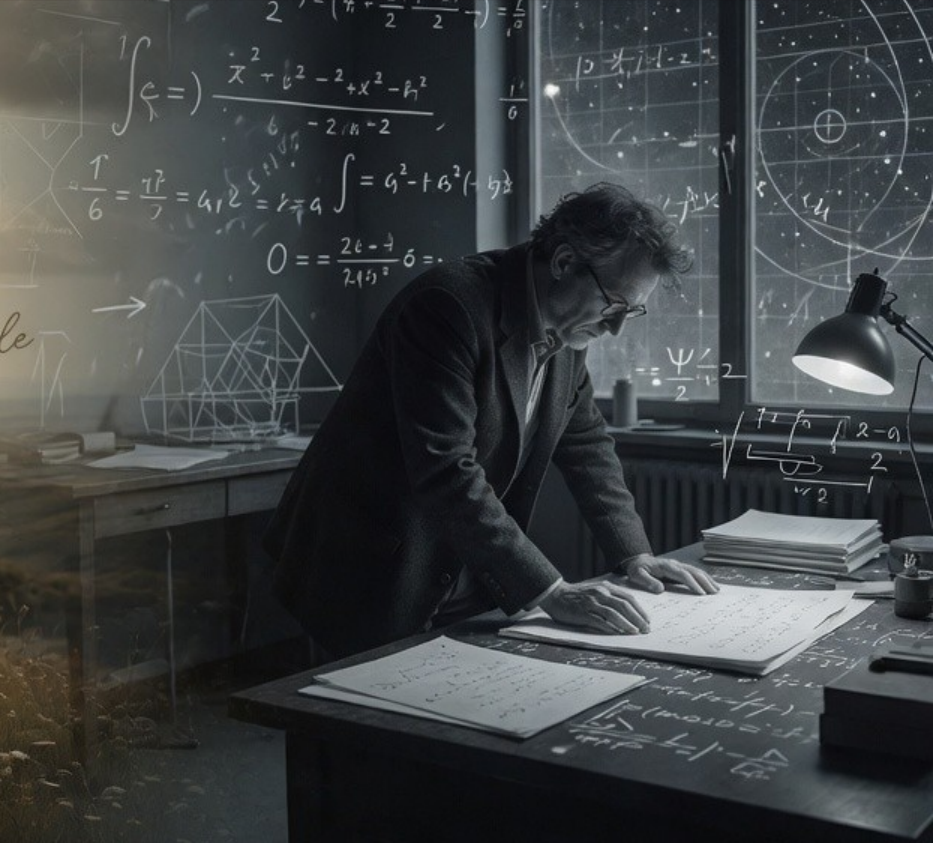
The physicists have
mathematics
with no universal field.



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The Whole



Everyone Is Missing the Same Thing

THE PHILOSOPHERS

The panpsychists. The idealists. The filter theorists.

A field. No mathematics.

The vision entire, and not one line of algebra under it.

THE PHYSICISTS

Wrote the object down in 1926. Use it every working day.

Mathematics. No field.

A century insisting it is only a device for computing odds.

THE OBJECTION

Or physics is right, and there is nothing it is like to be an equation.



Mike Towler when he was young and pretty.
A long time ago

Mike Speculates

A what-if question, not a proof of
anything...

The question is real.

From here to the objections, this is a suggestion, not a tour of other people's ideas.

THE UNIVERSAL de Broglie-Bohm Wave Function

In the de Broglie-Bohm theory, the wave function Ψ guides the motion of particles through the quantum potential. For a universal description, Ψ encodes all possibilities across configuration space.

$$i \hbar \frac{\partial \Psi}{\partial t} = \hat{H} \Psi$$

$$\hat{H} = -\frac{\hbar^2}{2m} \nabla^2 + V$$

$$\Psi(x, t) = R(x, t) e^{iS(x, t)/\hbar}$$

$R(x, t)$: amplitude

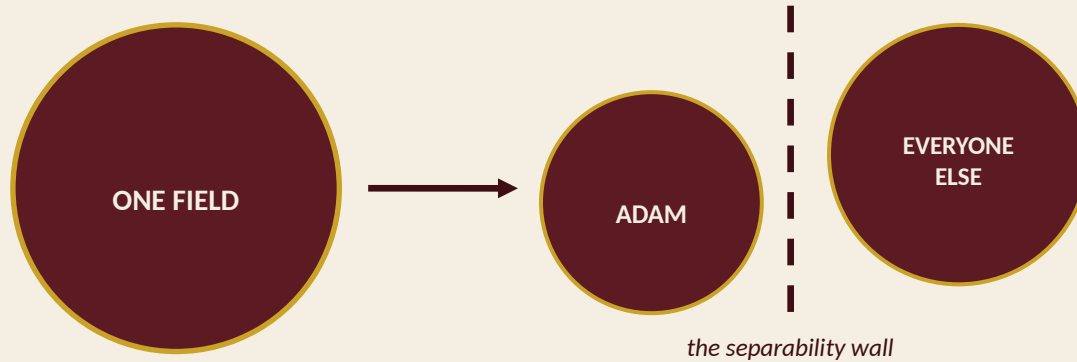
$S(x, t)$: phase

The velocity of particles is guided by $v = \left(\frac{1}{m}\right) \nabla S$



Phase $S(x, t) / \hbar$
(guiding the velocity field)

One Into Many



SEPARABILITY

One field, written as a product of factors, one per subsystem. Each factor then guides its own particles and ignores everybody else's.

NOT A SUPERPOSITION

A sum is one system, many states. A product is many systems, one universe.

PLOTINUS

The One overflowing without ever being diminished, made quantitative.

$$\Psi(\mathbf{x}_1, \mathbf{x}_2, \dots, \mathbf{x}_N) = \Psi_1(\mathbf{x}_1, \dots, \mathbf{x}_{N_1}) \Psi_2(\mathbf{x}_{N_1+1}, \dots, \mathbf{x}_N)$$

THE OBJECTION

Last time you told us the wave function was a sum of possibilities. Now it is a product. Which is it?

Then Why Can Eve Punch Him?

THE OBJECTION

If Adam is genuinely sealed, nothing can reach him. And yet Eve can break his nose.

Not the whole man. A sector inside him.

THE OBJECTION

And gravity couples everything to everything. Your wall was never sealed in the first place.

Two Channels

COHERENT

Waves marching in step. While the step holds, the system is genuinely several states together, not merely undecided.

ENTANGLED

The same discipline shared across many particles: one joint system, no longer separable into this one and that one.

DECOHERED

One stray photon and the step is lost. Which is why your world looks solid instead of shimmering.

THE LOUD CHANNEL

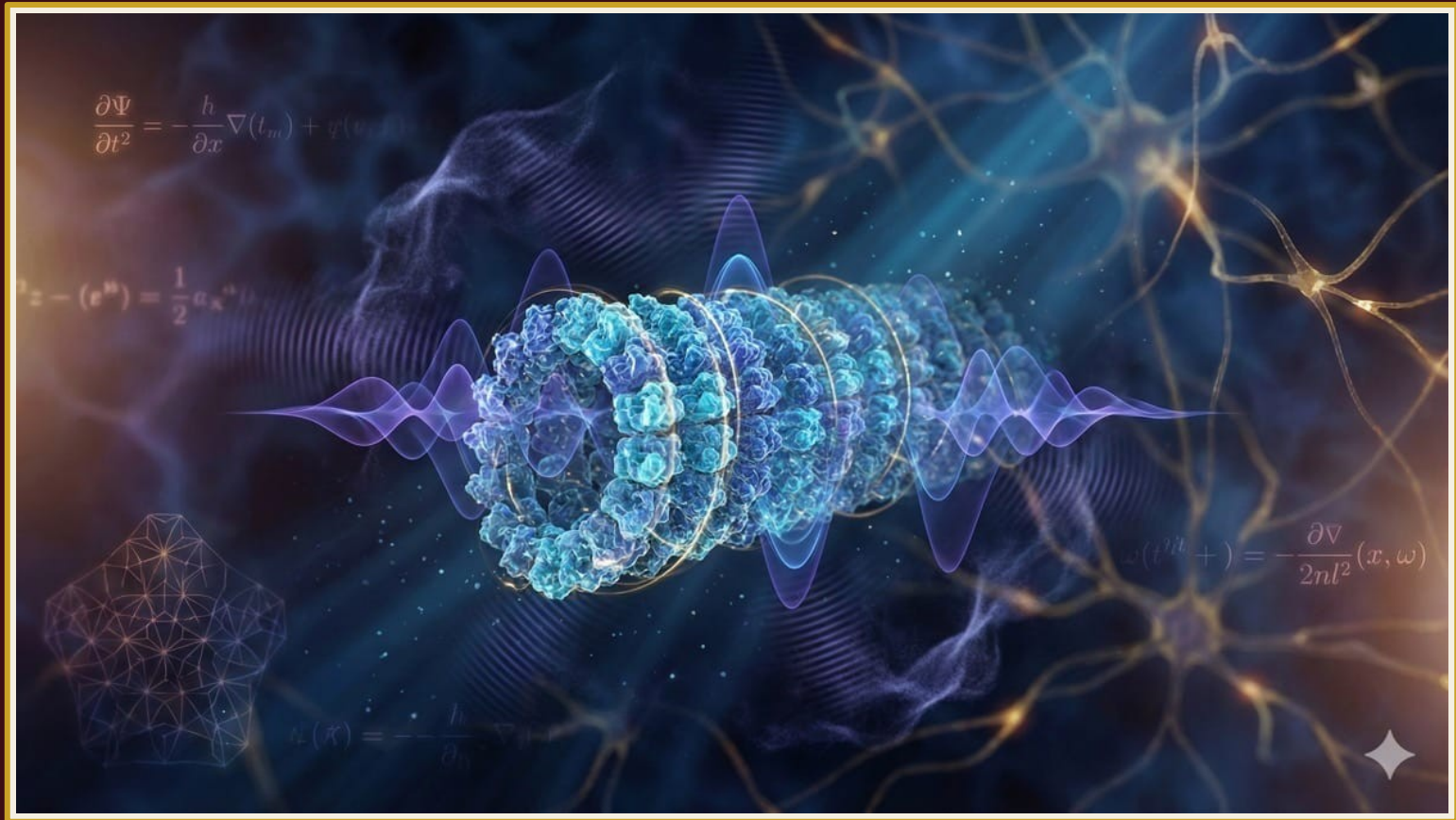
Momentum. Heat. Pressure. The shape of a fist in the air. Already measured, constantly, by everything around him.

THE FRAGILE CHANNEL

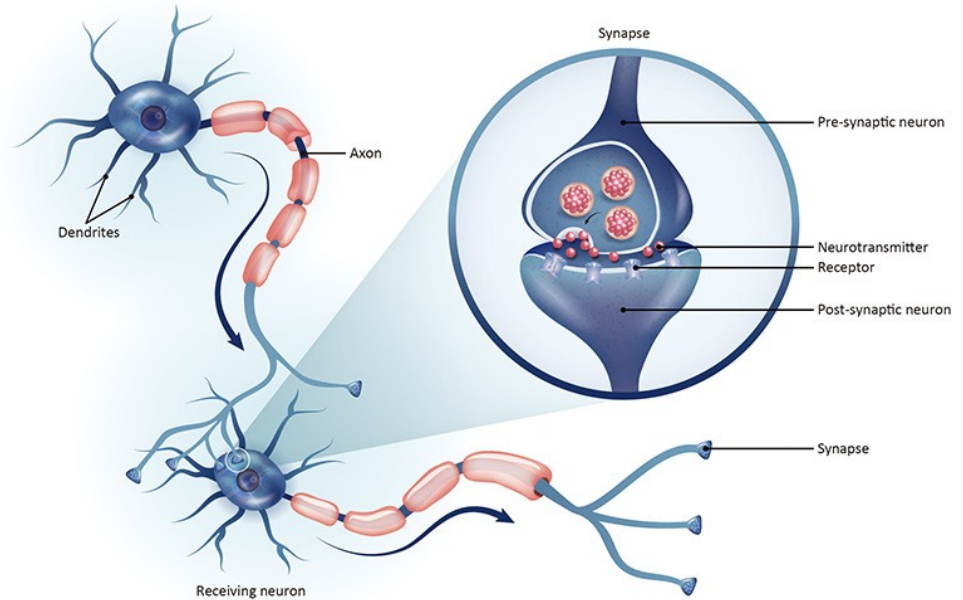
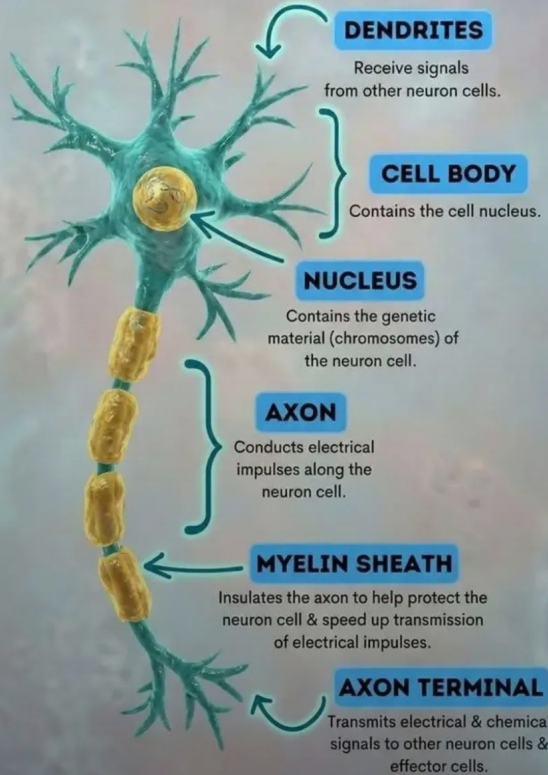
Fine-grained relative phase. Absurdly easy to spoil, and the only channel on which a mind could be read.

Battered on one, sealed on the other.

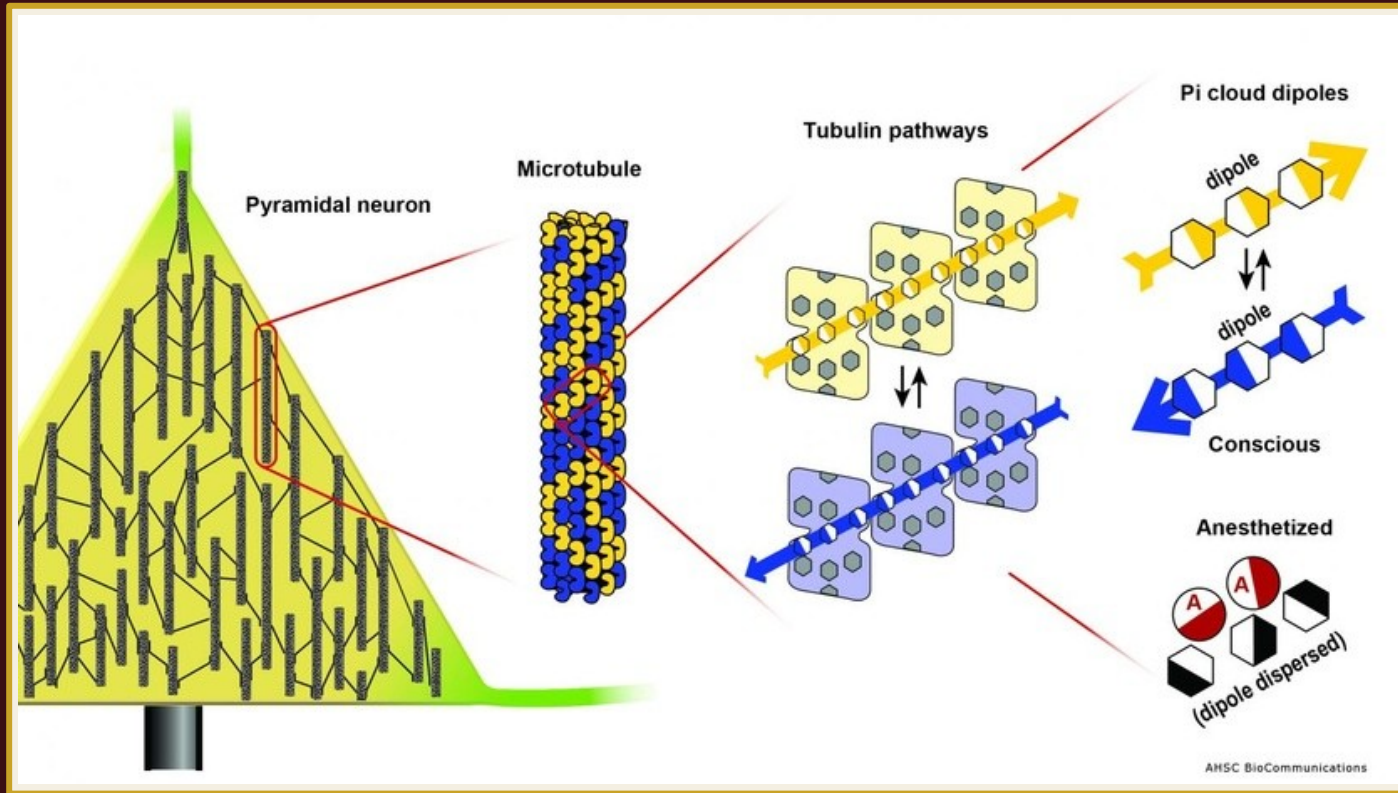
Microtubules!



PARTS OF A NEURON

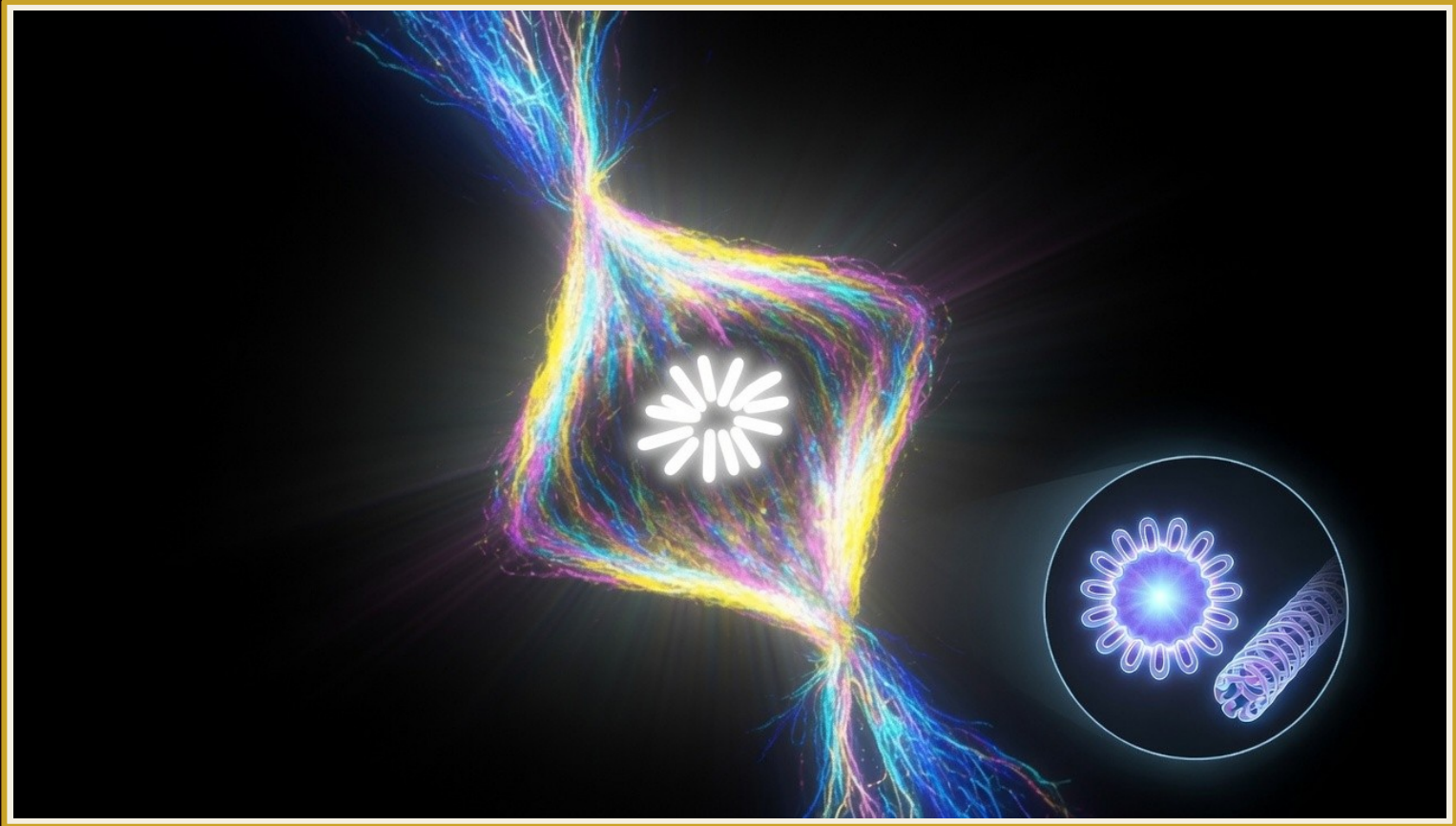


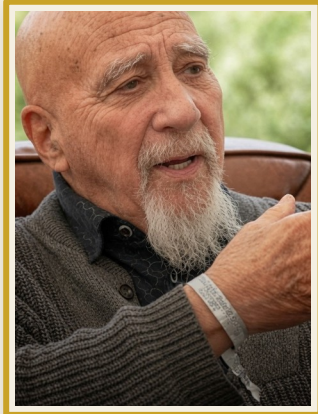
Neurons and Microtubules



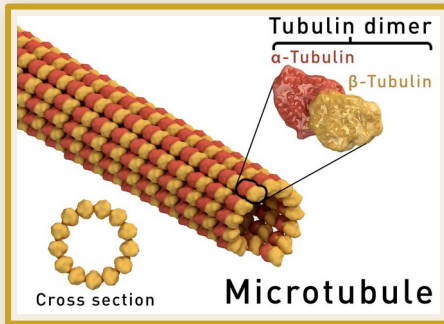
Neuron to microtubule to tubulin: conscious, and anaesthetised. Illustration: AHSC BioCommunications.

Spindle





Stuart Hameroff, the anaesthetist



Microtubule and tubulin dimer (schematic).

The Shelter

HYDROPHOBIC POCKETS

Oily, water-hating chambers inside tubulin: water, the great destroyer of coherence, shut out.

TRYPTOPHAN INDOLE RINGS

≈ 8 per tubulin, ≈ 2 nm apart: close enough, Hameroff claims, to entangle.

RING CURRENTS: MHz → 40 Hz GAMMA

A nested hierarchy of resonance: a millionfold span, in a chamber kept dry in a wet world.

ORCHESTRATED OBJECTIVE REDUCTION

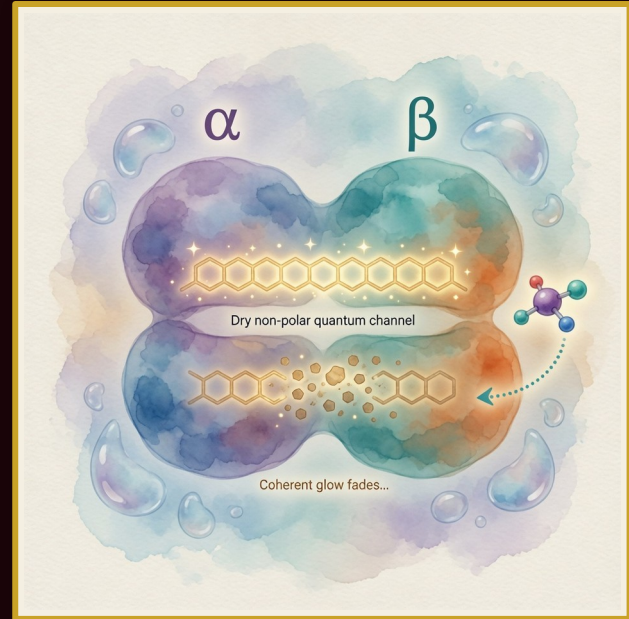
Penrose wanted a place in the brain where quantum effects could live. An anaesthetist handed him one.

The Anaesthesia Clue

The drugs that take the light out bind in the same oily pockets we just looked at, and their potency tracks the polarisability of the molecule rather than anything about membranes.

The switch has an address.

Suggestive, not settled.



The address. (AI-generated image.)

What the Last Two Years Did

Two years of laboratory work, and it did not fall evenly.

MEASURED RESULT

THE ANAESTHETIC TARGET

The inhalational agents act on microtubules, and act on them functionally.

MEASURED RESULT

TEN NANoseconds

Coherence in isolated preparations: ten thousand times the figure anybody defended twenty years ago.

THEORETICAL MODEL

SUPERRADIANCE

Whole lattices emitting light together, across the tryptophan network.

THE OBJECTION

Laboratory preparations are not brains.

The Join In The Chain

WHAT THE SHELTER DOES

Keeps coherence alive inside one warm body. Every experiment on the last four slides is about this wall and no other.

WHAT I NEED IT TO DO

Seals that same body off from the universal field. A different wall, in a different direction, and nothing makes the first one do it.

TWO WALLS. ONE PAID FOR.

THE OBJECTION

Shielded from his own body is not the same as hidden from God.

The Undescended Soul

*A man roasted alive in a bronze bull,
and the highest part of the soul feels none of it.*

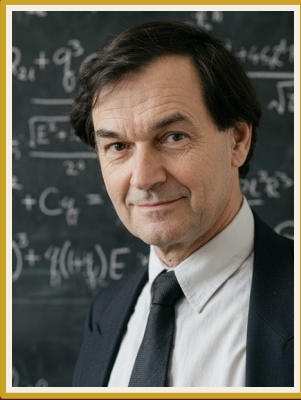
Plotinus, Ennead I.4.13 (the bull); the undescended soul, Ennead IV.8.8: twenty centuries before microtubules, the shielded sector, described.

Body freely interacting. Mind specially insulated. Physics rediscovered this, and didn't notice whose door it was knocking on.



The Bull of Phalaris (AI-generated image).

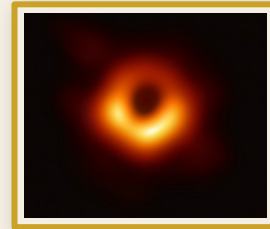
The theoretical side of Orch-OR



ROGER PENROSE

Nobel laureate · proved black holes must form

Forty years arguing something his colleagues find deeply embarrassing: consciousness is not a computation. Whatever the mind is doing, it is not running an algorithm. Tubulins in superposition, entangled across the brain, collapsing forty times a second, and gravity is what pulls the trigger.



THE OBJECTION

Last time you spent an entire evening telling us the wave function never collapses.

What Penrose Got Right

EARLIER: THE PHYSICISTS. MATHEMATICS, NO FIELD. **EXCEPT ONE.**

GIVES

A respectable argument, from a Nobel physicist, that consciousness needs quantum physics and lives somewhere delicate. It puts the quantum in the room.

DOESN'T

A universal field. Even reaching into cell division, it is still local biology, one system at a time: tubulin to tubulin, one brain's business. And it runs on collapse: the pilot wave field has none. A rival, not a stage.

One stubborn fact, put to opposite work. He pays for it with a new law of nature. I do not.

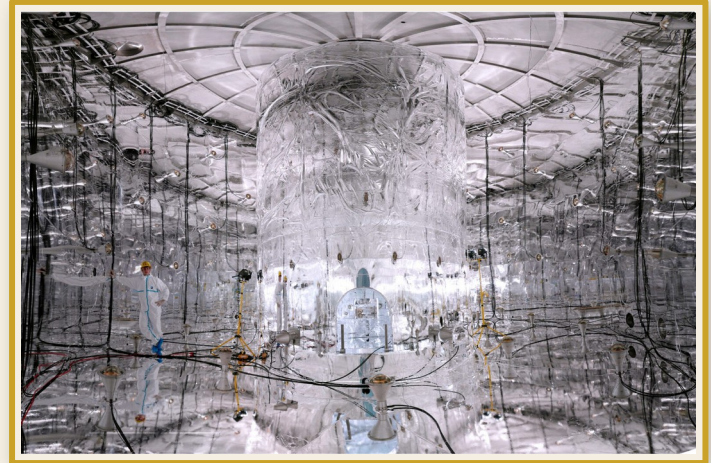
And the Engine Got Weaker

THE ENGINE: WEAKER

The parameter-free gravitational collapse model predicts faint radiation. A germanium search under Gran Sasso went looking in 2021, did not find it, and ruled the model out. A second underground result strengthened the bound.

WHAT SURVIVES THE BOUND

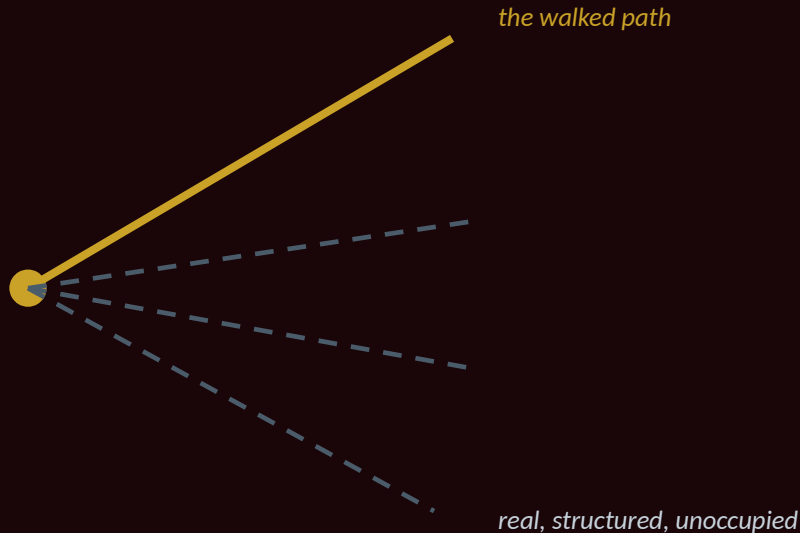
Coloured-noise variants live on. So does Penrose's own, which he holds is silent by construction.



A germanium detector array. Gran Sasso, Abruzzo.

Keep the room. Hand back the engine.

The Roads Not Taken



Not destroyed. Abandoned.

In Penrose's picture, awareness is the universe throwing away every road but one, forty times a second.

In the de Broglie Bohm picture it declines a road, and the road is still there.

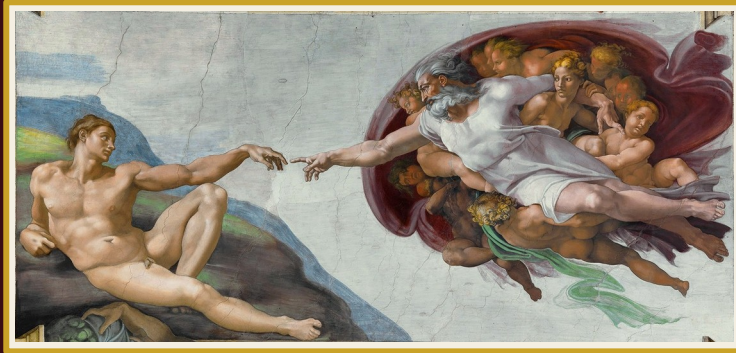
David Deutsch: many worlds in chronic denial. Answer: not denial, restraint.

We borrowed a collapse. We hand it back larger than we borrowed it.

Adam

ADAM (one mind)

A miracle = switching on a coupling term, formally the same kind of thing as a photon hitting the eye. And gravity never lets the coupling reach zero.



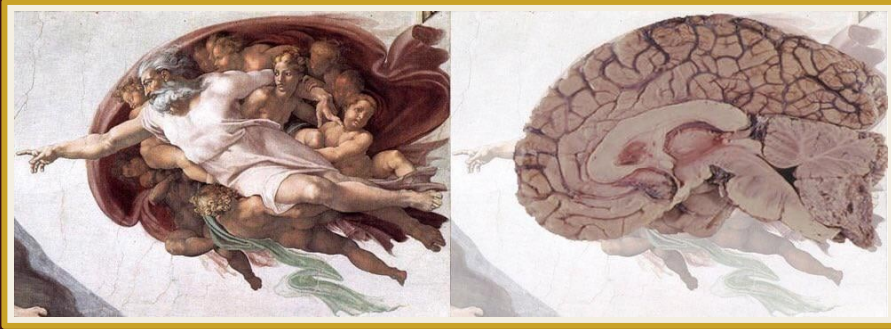
Michelangelo, Sistine Chapel ceiling, c. 1512.

GOD (the whole field)

Factorises off a piece of himself, seals it behind the wall. Voluntarily creates something he cannot read: tzimtzum, self-contraction.

Not the God of withdrawal. Immanence: present in all things, faintly, always.

The Gap



The shroud, and a sagittal brain section at the same angle.

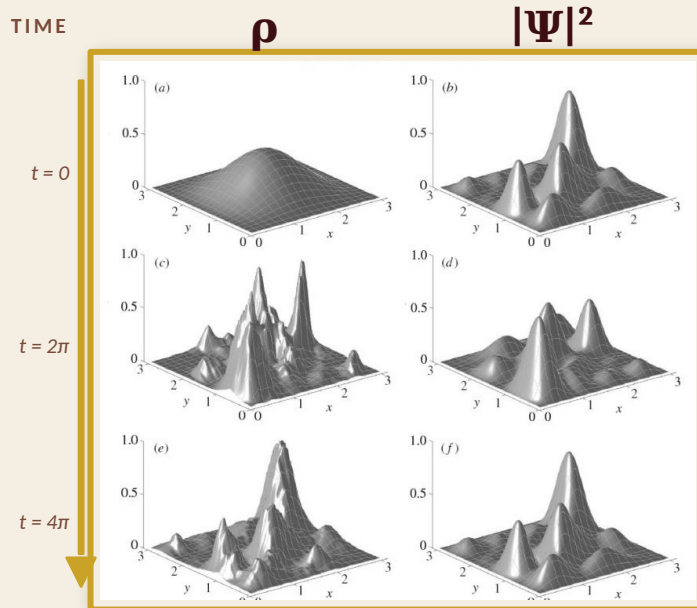


Michelangelo, *The Creation of Adam* (Sistine Chapel ceiling, c. 1512).

Faint is not zero. *He cannot quite reach. He cannot quite let go. The same gap, read from either end.*

The Wall Is Not A Law

The Born rule is not an axiom here. It is an equilibrium, reached by relaxation, exactly like a gas.



The actual particle distribution, stirred by the field into the shape the textbook assumes. My 2009 Cambridge lecture, after Valentini and Westman (2005).

IN ORDINARY QUANTUM MECHANICS

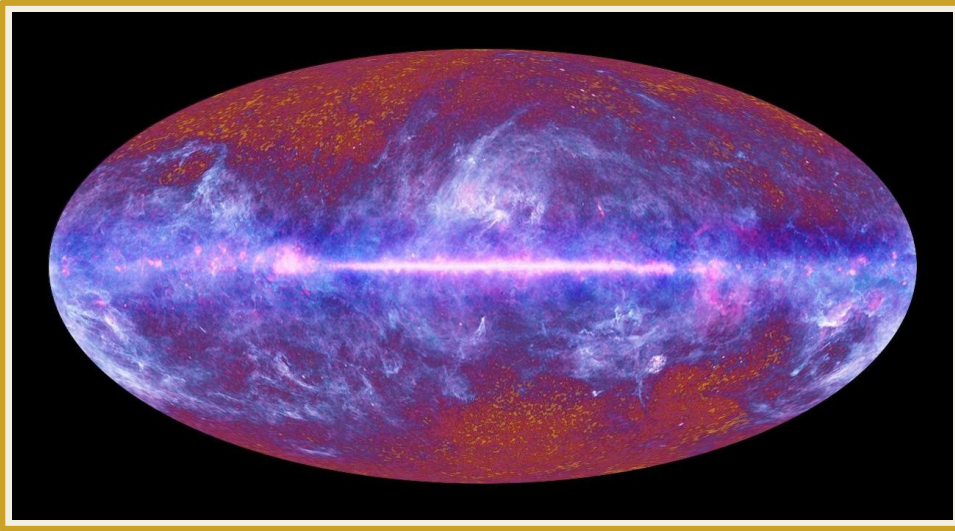
$|\Psi|^2$ = probability is a POSTULATE. Born wrote it down in 1926 and it has been assumed ever since.

IN PILOT WAVE THEORY

It is a RESULT. Particles steered by the field settle into that distribution and stay there, as a gas settles into thermal equilibrium.

Towler, Russell & Valentini, Proc. R. Soc. A 468, 990 (2012).

Where You Would Actually Look



The all-sky cosmic microwave background map: the oldest light there is.

THE HONESTY

1. Not a mechanism for telepathy. The slot exists; nothing is in it.
2. The theory forecasts its own failure in the laboratory, which is why the laboratory record reads as it does.
3. Look at the early universe, not at brains.

THE OBJECTION

If the wall is only statistical, why has nobody ever read a mind?

What Would It Be Like to Be the Undivided Field?

Nothing in particular.

Maximally full, and for that exact reason, functionally empty.

The Equation With No Time In It



John Wheeler
(AI-restored photograph.)

$$H\Psi = 0$$

*The Wheeler-DeWitt equation. No external time parameter.
Genuinely timeless: not everything happening at once, but no
happening at all.*



Bryce DeWitt
(AI-restored photograph.)

THE OBJECTION

That is a description of what the mathematics does, not an explanation.

Let There Be Time



“Let there be light.”

Read it as: let there be separation.

Read it as: let there be time.

Page-Wootters: the partition IS the origin of time.

Why Would the One Divide?

Not boredom.

Necessity.

A totality with nothing outside it cannot experience itself: no contrast, no knower and known, and no time in which to do anything anyway. Divide. Break the symmetry. Raise a wall. That is the only route from blank undifferentiated potential into actual, felt, particular existence.



Now I Argue Against Myself

The honesty is the argument, not a disclaimer.

About eight objections. Two are fatal to calling any of this science.



Where Does the Field Live?

3N-SPACE

The wave function lives on a space with three dimensions for every particle in the universe, not the three we inhabit. Strictly, it doesn't have a "here" at all.

3-SPACE

Honest work rewrites it on ordinary space, and the white dwarf (S20) is the witness. But its behaviour still depends, instantly, on everything everywhere.

This relocates God into three-dimensional space. It does not make him keep still.

THE OBJECTION

It does not live in the world. It has no address in the room you are standing in.

Better Office Space, Then the Inversion

*This does not solve the hard problem.
At best, it gives it a grander office to sit in.
Same tenant.*

Not: *why is there something it is like to be you?*

But: ***why is there so little that it is like to be you?***

The hard problem is an artefact of one mode of attention. Put the whole first and it becomes a physics question with a partial answer.

THE OBJECTION

You have changed the question.

What Survives

CREDIT

Real physics, not my invention: de Broglie, Bohm, Bell, Valentini did the work. The one genuinely universal, genuinely causal field on offer. The individuation is real mathematics. The timelessness of the whole-universe equation is real. The birth of time from partition is a real, published mechanism.

DEBIT

1. The identification of that field with consciousness is not proven and not testable.
2. Two speculative floors, one stacked on the other, and no scaffolding under either.
3. The field has no address in the room you are standing in.
4. The shelter protects Adam from his own body. I need it to protect him from the universe. Two walls; one paid for.

The Valve, Revisited

James, Bergson, Huxley (S7): a valve on WHAT? Now I can answer them.

On the one undivided field.

*The brain is not a lamp, and not merely a filter:
the brain is the shape of the partition.*

The combination problem, dissolved: you never had to build the one out of many. The many are what you get when it divides.

Samantha



Samantha Keil.

Blavatsky. Bailey. Seth.

Where the second lecture ended, and where she told me to look before I had got there myself.

Uncontaminated by formal technical education → able to see roads others cannot.

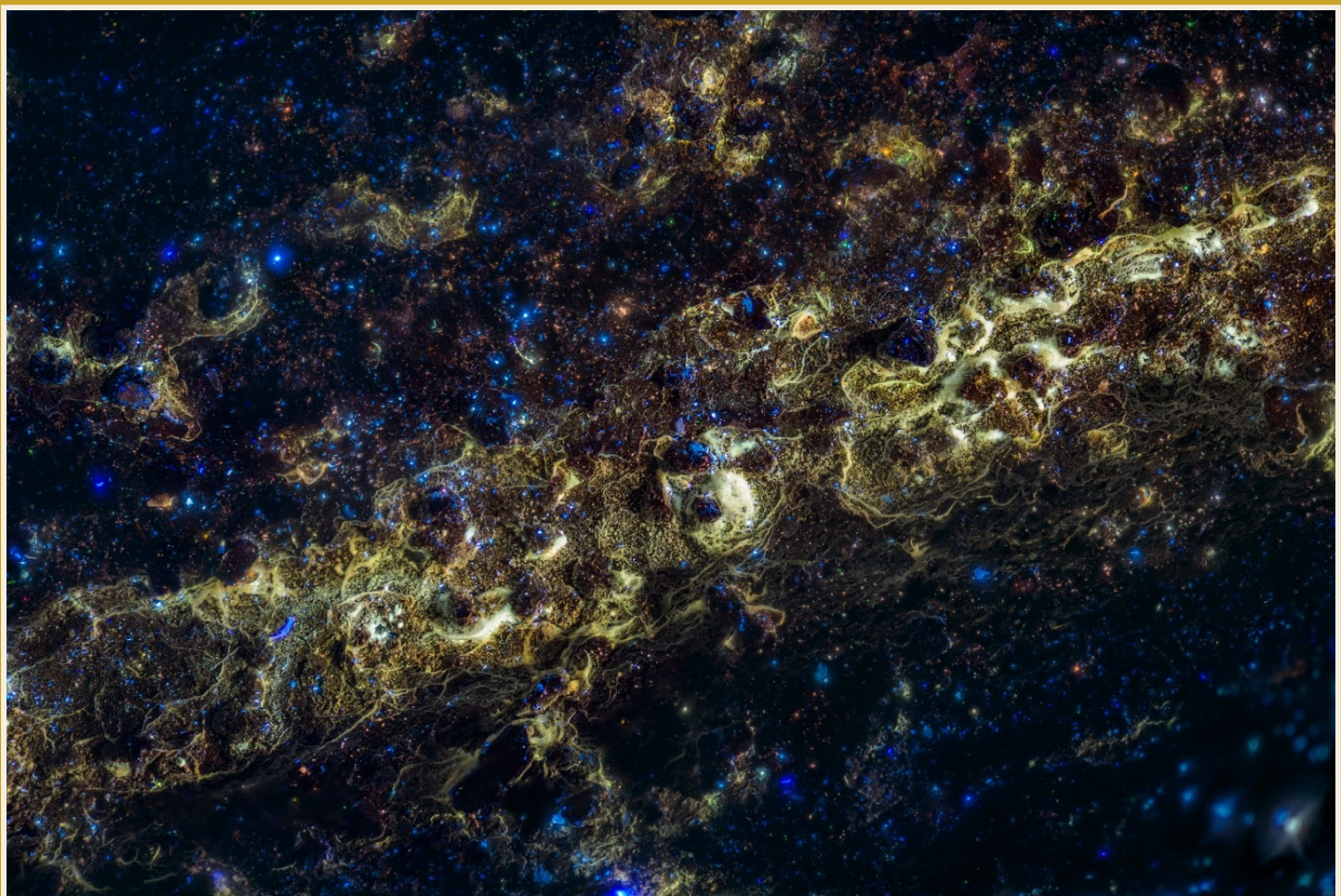
Same clearing. Other road.



Sabre, by Samantha Keil. Keil Space, Viale Michelangiolo 5, Florence.

If the second mode is a real way of knowing, that is what it looks like from the outside.

Macrophotography by Alberto Ghizzi Panizza





Three Roads, Same Destination

THE FIELD

Bohm's road. A real universal field that divides into minds.

THE PHILOSOPHERS

Panpsychists, idealists, filter theorists: mind is fundamental; the brain receives it.

THE THEORY

The two modes of attention, still unnamed. Opens next time; lands on this same spot.

Coincidence, or not. Sit with it until next time.

Next time:

The Theory Gets a Name.

Bring the second mode of attention. You are going to need it.