

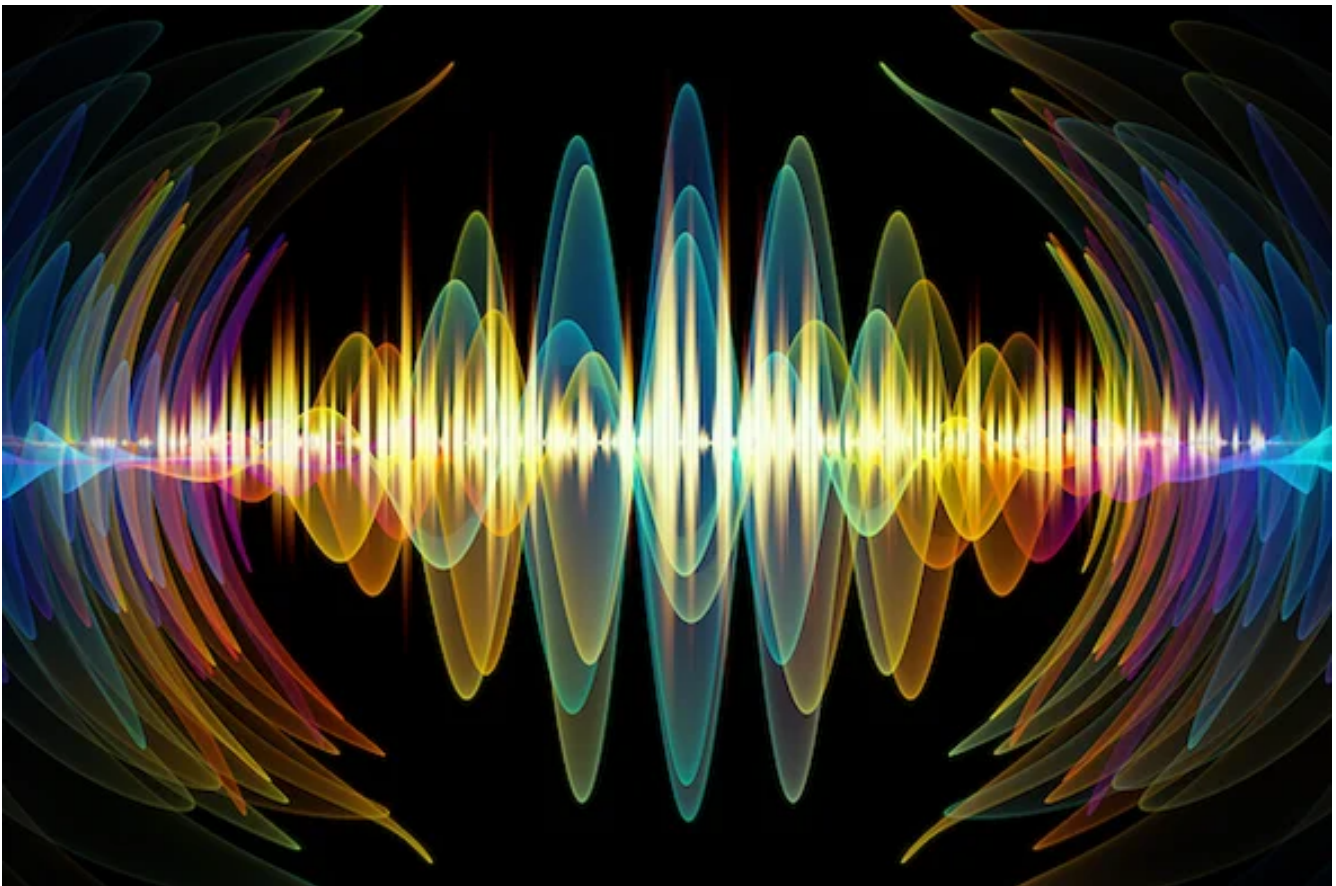


## *Observations*

# The Hippies Were Right: It's All about Vibrations, Man!

A new theory of consciousness

By Tam Hunt on December 5, 2018



Credit: Getty Images

Why are some things conscious and others apparently not? Is a rat conscious? A bat? A cockroach? A bacterium? An electron?

These questions are all aspects of the ancient “mind-body problem,” which has resisted a generally satisfying conclusion for thousands of years.

The mind-body problem enjoyed a major rebranding over the last two decades and is generally known now as the “hard problem” of consciousness (usually capitalized nowadays), after the New York University philosopher David Chalmers coined this term in a now classic 1995 paper and his 1996 book *The Conscious Mind: In Search of a Fundamental Theory*.

Fast forward to the present era and we can ask ourselves now: Did the hippies actually solve this problem? My colleague Jonathan Schooler of the University of California, Santa Barbara, and I think they effectively did, with the radical intuition that it’s all about vibrations ... man. Over the past decade, we have developed a “*resonance theory of consciousness*” that suggests that resonance—another word for synchronized vibrations—is at the heart of not only human consciousness but of physical reality more generally.

So how were the hippies right? Well, we agree that vibrations, resonance, are the key mechanism behind human consciousness, as well as animal consciousness more generally. And, as I’ll discuss below, that they are the basic mechanism for all physical interactions to occur.

All things in our universe are constantly in motion, vibrating. Even objects that appear to be stationary are in fact vibrating, oscillating, resonating, at various frequencies. Resonance is a type of motion, characterized by oscillation between two states. And ultimately all matter is just vibrations of various *underlying fields*.

An interesting phenomenon occurs when different vibrating things/processes come into proximity: they will often start, after a little time, to vibrate together at the same frequency. They “sync up,” sometimes in ways that can seem mysterious. This is described today as the phenomenon of spontaneous self-organization.

Examining this phenomenon leads to potentially deep insights about the nature of consciousness and about the universe more generally.

## **ALL THINGS RESONATE AT CERTAIN FREQUENCIES**

Stephen Strogatz provides various examples from physics, biology, chemistry and neuroscience to illustrate what he calls “sync” (synchrony) in his 2003 book also called *Sync*, including:

- Fireflies of certain species start flashing their little fires in sync in large gatherings of fireflies, in ways that can be difficult to explain under traditional approaches.
- Large-scale neuron firing can occur in human brains at specific frequencies, with mammalian consciousness thought to be commonly associated with various kinds of neuronal synchrony.
- Lasers are produced when photons of the same power and frequency are emitted together.
- The moon's rotation is exactly synced with its orbit around the Earth such that we always see the same face.

Resonance is a truly universal phenomenon and at the heart of what can sometimes seem like mysterious tendencies toward self-organization.



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Pascal Fries, a German neurophysiologist with the Ernst Strüngmann Institute, has explored in his highly cited work over the last two decades the ways in which various electrical patterns, specifically, gamma, theta and beta waves, work together in the brain to produce the various types of human consciousness.

These names refer to the speed of electrical oscillations in the various brain regions, as measured by electrodes placed on the outside of the skull. Gamma waves are typically defined as about 30 to 90 cycles per second (hertz), theta as a 4- to 7-hz rhythm, and beta as 12.5 to 30 hz. These aren't hard cutoffs—they're rules of thumb—and they vary somewhat in different species.

So, theta and beta are significantly slower than gamma waves. But the three work together to produce, or at least facilitate (the exact relationship between electrical brain patterns and consciousness is still very much up for debate), various types of human consciousness.

Fries calls his concept “communication through coherence” or CTC. For Fries it's all about neuronal synchronization. Synchronization, in terms of shared electrical oscillation rates, allows for smooth communication between neurons and groups of neurons. Without coherence (synchronization), inputs arrive at random phases of the neuron excitability cycle and are ineffective, or at least much less effective, in communication.

Our resonance theory of consciousness builds upon the work of Fries and many others, in a broader approach that can help to explain not only human and mammalian consciousness, but also consciousness more broadly. We also speculate metaphysically about the nature of consciousness as a more general phenomenon of all matter.

## **ARE ALL THINGS AT LEAST A LITTLE BIT CONSCIOUS?**

Based on the observed behavior of the entities that surround us, from electrons to atoms to molecules to bacteria to paramecia to mice, bats, rats, etc., all things may be viewed as at least a little conscious. This sounds strange at first blush, but “panpsychism”—the view that all matter has some associated consciousness—is an increasingly accepted position with respect to the nature of consciousness.

The panpsychist argues that consciousness (subjectivity) did not emerge; rather, it’s always associated with matter, and vice versa (they are two sides of the same coin), but mind as associated with most of the matter in our universe is generally very simple. An electron or an atom, for example, enjoy just a tiny amount of consciousness. But as matter “complexifies,” so mind complexifies, and vice versa.

Biological organisms have leveraged faster information exchange through various biophysical pathways, including electrical and electrochemical pathways. These faster information flows allow for more macro-scale levels of consciousness than would occur in similar-scale structures like boulders or a pile of sand, simply because there is significantly greater connectivity and thus more “going on” in biological structures than in a boulder or a pile of sand. Boulders and piles of sand only have thermal pathways with very limited bandwidth.

Boulders and piles of sand are “mere aggregates” or just collections of more rudimentary conscious entities (probably at the atomic or molecular level only), rather than combinations of micro-conscious entities that combine into a higher level macro-conscious entity, which is the hallmark of biological life.

Accordingly, the *type* of communication between resonating structures is key for consciousness to expand beyond the rudimentary type of consciousness that we expect to occur in more basic physical structures.

The central thesis of our approach is this: the particular linkages that allow for macro-consciousness to occur result from a shared resonance among many micro-conscious constituents. The speed of the resonant waves that are present is the limiting factor that determines the size of each conscious entity.

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As a shared resonance expands to more and more constituents, the particular conscious entity grows larger and more complex. So, the shared resonance in a human brain that achieves gamma synchrony, for example, includes a far larger number of neurons and neuronal connections than is the case for beta or theta rhythms alone.

It's resonating structures all the way down—and up.

Our resonance theory of consciousness attempts to provide a unified framework that includes neuroscience and the study of human consciousness, but also more fundamental questions of neurobiology and biophysics. It gets to the heart of the differences that matter when it comes to consciousness and the evolution of physical systems.

It is all about vibrations, but it's also about the type of vibrations and, most importantly, about shared vibrations.

Put that in your pipe and smoke it ... man.

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