notes wiki em theories of consciousness

ie em fields effect consciousness

http://en.wikipedia.org/wiki/Electromagnetic_theories_of_consciousness

Electromagnetic *field* theories (or "EM field theories") of consciousness propose that consciousness results when a brain produces an electromagnetic field with features that meet certain criteria.

Some electromagnetic theories are also quantum mind theories of consciousness; examples include quantum brain dynamics (QBD) approaches of Mari Jibu and Kunio Yasue[6] and of Giuseppe Vitiello.[7] In general, however, quantum mind theories other than these QBD approaches do not treat consciousness as an electromagnetic phenomenon.

CEMI
The starting point for McFadden and Pockett's theory is the fact that every time a neuron fires to generate an action potential, and a postsynaptic potential in the next neuron down the line, it also generates a disturbance in the surrounding electromagnetic field.

Studies undertaken towards the end of the 20th century are argued to have shown that conscious experience correlates not with the number of neurons firing, but with the synchrony of that firing.[

McFadden proposes that the digital information from neurons is integrated to form a conscious electromagnetic information (cemi) field in the brain. Consciousness is suggested to be the component of this field that is transmitted back to neurons, and communicates its state externally. Thoughts are viewed as electromagnetic representations of neuronal information…

In 2013, McFadden cited recent experiments in the laboratories of Christof Koch and David McCormick which demonstrated that external EM fields simulate the brain's endogenous EM fields, and influence neuronal firing patterns within the brain.

Susan Pockett[1] has advanced a theory, which has a similar physical basis to McFadden's, with consciousness seen as identical to certain spatio-temporal patterns of the EM field. However, whereas McFadden argues that his deterministic interpretation of the EM field is not out-of-line with mainstream thinking, Pockett suggests that the EM field comprises a universal consciousness that experiences the sensations, perceptions, thoughts and emotions of every conscious being in the universe. However, while McFadden thinks that the field is causal for actions, albeit deterministically, Pockett does not see the field as causal for our actions.

QBD
The concepts underlying this theory derive from the physicists, Hiroomi Umezawa[14] and Herbert Fröhlich[15] in the 1960s. More recently, their ideas have been elaborated by Mari Jibu and Kunio Yasue. Water comprises 70% of the brain, and quantum brain dynamics (QBD) proposes that the electric dipoles of the water molecules constitute a quantum field, referred to as the cortical field, with corticons as the quanta of the field. This cortical field is postulated to interact with quantum coherent waves generated by the biomolecules in neurons, which are suggested to propagate along the neuronal network. The idea of quantum coherent waves in the neuronal network derives from Herbert Frohlich. He viewed these waves as a means by which order could be maintained in living systems, and argued that the neuronal network could support long-range correlation of dipoles. This theory suggests that the cortical field not only interacts with the neuronal network, but also to a good extent controls it.

OBJECTIONS
"No serious researcher I know believes in an electromagnetic theory of consciousness,"[16] Bernard Baars wrote in an e-mail. Baars is a neurobiologist and co-editor of Consciousness & Cognition

David Chalmers[20] argues that quantum theories of consciousness suffer from the same weakness as more conventional theories. Just as he argues that there is no particular reason why particular macroscopic physical features in the brain should give rise to consciousness, he also thinks that there is no particular reason why a particular quantum feature, such as the EM field in the brain, should give rise to consciousness either.

Jeffrey Gray states in his book *Consciousness: Creeping up on the Hard Problem*, that tests looking for the influence of electromagnetic fields on brain function have been universally negative in their result

despite the existence of transcranial magnetic stimulation with medical purposes,

Influence on brain function

The different EM field theories disagree as to the role of the proposed conscious EM field on brain function. In McFadden's cemi field theory, as well as in Drs Fingelkurts' Brain-Mind Operational Architectonics theory, the brain's global EM field modifies the electric charges across neural membranes, and thereby influences the probability that particular neurons will fire, providing a feed-back loop that drives free will. However, in the theories of Susan Pockett and E. Roy John, there is no necessary causal link between the conscious EM field and our consciously willed actions.

References to "Mag Lag", also known as the subtle effect on cognitive processes of

MRI machine operators exposed to the magnetic field of the MRI machine sometimes experience “Mag Lag”. The symptoms include memory loss and delays in information processing, and have been reported, in some cases several hours after exposure.

who sometimes have to go into the scanner room to check the patients and deal with issues that occur during the scan could suggest a link between magnetic fields and consciousness.

.