Superradiance is central to studies of collective behaviour in areas of quantum optics, cavity quantum electrodynamics, laser physics and Bose-Einstein condensation.
http://www.qo.phy.auckland.ac.nz/superradiance.html

http://www.scaruffi.com/mind/yasue.html: book review
Mari Jibu & Kunio Yasue

QUANTUM BRAIN DYNAMICS AND CONSCIOUSNESS (John Benjamins, 1995)
The Heisenberg and Von Neumann tradition has always viewed the brain as a "quantum measuring device". But the Japanese physicist Kunio Yasue, the American physicist Gordon Globus and others, claims that brain substrates uphold second-order quantum fields, which cannot be treated as mere measuring devices. Yasue, building on the quantum field theory developed in the 1960s by the Japanese physicist Hiroomi Umezawa, has developed a "quantum neurophysics" that explains how the classical world can originate from quantum processes in the brain. Yasue is not a connectionist. The fact that neurons are organized inside the brain is of negligible importance in his theory. Yasue thinks that several layers of the brain can host quantum processes, whose quantum properties explain consciousness and cognition. Yasue presents the brain as a macroscopic quantum system. He focuses on water megamolecules in the space between neurons, which can combine to form extended quantum systems, interacting with the neural networks. He focuses on the sensory system, whose quantum field causes some special molecules in the membrane of the neuron to undergo Froehlich condensation and cause, in turn, macroscopic coherence. He focuses on structures such as microtubules which lie inside the neuron, and which contain quasi-crystalline water molecules that again lend themselves to quantum effects. The function of this quantum field could be cognitive: some particular quantum states could record memory. He focuses on a bioplasma of charged particles which interact with the electromagnetic field, an ideal vehicle for a merge of the sensory quantum field with the memory quantum field, an ideal vehicle for the creation of classical reality. Thus, classical order can continually unfold in the perimembranous bioplasma. According to traditional interpretations of Quantum Theory, classical order unfolds because of a measurement and the consequent collapse of the wave function. According to Globus, classical order unfolds from the interaction between quantum cognition (the memory quantum field, or "holoworld") and quantum reality (the sensory quantum field). Heisenberg's discontinuous sequence of collapsed realities is replaced by a continuous unfolding of worlds from a holoworld. Consciousness could arise from the interaction between the electromagnetic field and molecular fields of water and protein. Furthermore, Yasue maintains that the evolution of the neural wave function is not random, as would result from the traditional quantum theories, but optimized under a principle of "least neural action". Random effects of consciousness are replaced by a "cybernetic" consciousness which is more in the tradition of the self as a free-willing agent.

Brain and Being: At The Boundary Between Science, Philosophy, Language, And Arts
By Gordon G. Globus, Karl H. Pribram, Giuseppe Vitiello
This book is the result of a meeting wth the title of "Quantum brain dynamics and the humanities: a new perspective for the 21st century", held at the Institute for Scientific Interchange (ISI) in Torino Italy in 2002. Those involved in the formulation of the quantum model of the brain were gathered to discuss the model implication for literature, pilosophy and the arts.

http://www.quantumconsciousness.org/penrose-hameroff/cambrian.html
Mari Jibu, Kunio Yasue and colleagues (Jibu et al., 1994), in developing their ideas of the quantum aspect of the human brain and consciousness, have proposed a process whereby cyclical superradiance (long range coherence) occurs in the water molecules of a microtubule.
Jibu et al. (1994).

http://www.emergentmind.org/kaivarainenI2.htm

HIERARCHIC MODEL OF CONSCIOUSNESS:
FROM MOLECULAR BOSE CONDENSATION
TO SYNAPTIC REORGANIZATION
Alex Kaivarainen
University of Turku, FIN-20520 Turku, Finland

The electrical recording of human brain activity demonstrate a coherent (40 to 70 Hz) firing among widely distributed and distant brain neurons (Singer, 1993). Such synchronization in a big population of groups of cells points to possibility of not only regular axon-mediated, but also of physical fields-mediated distant or even quantum nonlocal interaction between them.
<P>
The idea of Karl Pribram (Languages of the Brain, 1977) of holographic principles of memory and braining is very popular in quantum models of consciousness. We also support this general idea and try to transform it in concrete shape in our model. In contrast to usual holograms, reflecting the three-dimensional geometric properties of objects in photo materials, the information in the membranes and cytoskeleton of nerve cells is encoded in the form of our effectons and deformons, introduced in our Hierarchic theory of condensed matter (Kaivarainen 1995; 2000a).

Microtubules are hollow cylinders, filled with water. Their internal diameter about din 140Å and external diameter dext 280Å.

Microtubules sometimes can be as long as axons of nerve cells, i.e. tenth of centimeters long. Microtubules (MT) in axons are usually parallel and are arranged in bundles. Microtubules associated proteins (MAP) form a "bridges, linking MT and are responsible for their interaction and cooperative system formation. Brain contains a big amount of microtubules.

"biophotons" emission/absorption in the ultraviolet (UV) and visible range. Such radiation is possible due to water molecules dissociation<--> recombination in a course of cavitational fluctuations.

http://www.lifescientists.de/: <BR> inernational institute of Biophysics: Worldwide there are about 40 scientific groups working on biophotons. The biggest association is the International Institute of Biophysics (IIB) e.V., founded in 1996 in Neuss (Germany) for an interdisciplinary approach of the understanding and the investigation of living systems. 14 institutes (governmental research institutes and universities) are connected in common research on:

Coherence in Biology
Biocommunication
Biophotonics

The biophoton field is almost fully coherent and – as a consequence – strongly coupled to all physiological functions.<P>
It provides regulatory activity for every cell in the body.

It displays all the biological rhythms of the body.

The measurements of electric parameters of the skin provide a powerful tool for looking through the window of biological regulation.

Regulatory activities of the body are not stable, but rather rhythmical.

Powerful diagnostic and therapeutic tools can be developed.

importance of water