

Birla Institute of Technology and Science, Pilani
(Distance Learning Programmes Division)

**Programme: M.S. Consciousness Studies at Bhaktivedanta Institute,
Mumbai**

**Second Semester 2004-2005
CONS ZG629T: Dissertation**

ID No. : 2004HZ67002
NAME OF THE STUDENT : Deepak Gupta
COLLABORATING ORGANIZATION : Bhaktivedanta Institute
SUPERVISOR'S NAME : Prof. P.K. Joshi
SUPERVISOR'S EMAIL ADDRESS : pkjoshi@mailhost.tifr.res.in
DISSERTATION TITLE : Some studies in non-linear dynamics

ABSTRACT :

The understanding that most people within academia as well as outside it, have about physics is that it is applicable to what is called matter. This belief has its origins in the Cartesian dualism; according to which mind and matter are two ontologically separate entities. But mind or consciousness (we will use 'C' instead of consciousness in the rest of the thesis) is also a natural phenomenon and hence should be studied scientifically. There are various fields which try to study mind or 'C' like psychology, neuroscience, biology etc. But most people will agree that laws of physics give us the most fundamental description of the universe and that biological systems are just complex systems made up of large number of molecules/atoms and hence in principle these systems are reducible to physics. Given this, physics should also give a description of

'C'. Moreover, the worldview given by physics cannot be considered to be complete unless it gives description of this particular natural phenomenon.

In the thesis, I have tried to explore areas in mathematics and physics which might have a bearing on issues in consciousness studies like free will and evolution of consciousness. I have primarily studied various topics in non-linear dynamics, namely chaos theory, fractals and bifurcation theory. Apart from these, I have also tried to study complex systems and the phenomenon of emergence exhibited by them. There are various definitions of emergence given by various researchers. According to one of the definitions, emergent high-level properties are interesting, non-obvious consequences of low level properties. Thus, it is possible that 'C' is an emergent phenomenon given the laws of physics. Complex systems also exhibit phase transitions, I have also tried to find relations between emergence, phase transitions and self-reference.

Key words: Chaos theory, fractals, bifurcation theory, emergence, self-reference, phase transitions.

Signature of the Student

Name:

Date:

Place:

Signature of the Supervisor

Name:

Date:

Place: