

Life, evolution and complexity

Academic Seminar of Sophia-Iberia
Universidad Pontificia Comillas
Alberto Aguilera 25, Madrid
13-15 December, 2010

Life may be a natural consequence of the physical process of planetary formation or it may be something random, unique or very rare in the universe. Through the process of evolution life tends to become more complex and form advanced interdependent ecosystems. The human brain is said to be the most complex structure in the universe. Through interdisciplinary discussions between world leading researchers the understanding of life evolution and complexity will be discussed from different perspectives. It is the purpose of this scientific seminar to produce new ideas and move our understanding of life evolution and complexity to a higher level.

Session I: *The Physical Mind*

The origin of the fundamental physical structures of life in the universe and on earth. Organization and complexity as evolutionary factors of life and how the fundamental biochemical structures produce the organization in stable systems that tend to the complexity and their causal contribution to the physical origin of life. Life probably began being a pure chemical physical system that has been described as mechanical and deterministic (e.g. the RNA). After evolution, arriving at superior animals and man, a substantial part of the living organisms is a deterministic mechanism. The classic mechanism of the XIX and XX century can today be interpreted by a computer interpretation of life. The nervous systems would perhaps have been constructed like a mechanical computer systems of increasing complexity.

Speakers

Prof. Steen Rasmussen, Department for Physics & Chemistry
University of Southern Denmark, Odense, Denmark

Prof. Lluís Oviedo, Professor of Theological Anthropology
University Pontifical Antonianum, Rome, Italy

Session II: *The Neural Mind*

Sensation in the theory of evolution. Does the evolutionary theory describe something more than a world of mechanical transformations? What explanatory role does “sensation” play in the system of causes that produces the evolution? *Neural networks.* How and why the described neural networks classically explain the conduct of the living beings? Can choice be justified, that is the indetermination that makes freedom possible? How the brain produces sensations and the psychic world? The explanations

of Edelman on neural Darwinism; can they explain psychic indetermination and the holistic experience in living organisms? Can the brain be understood by serial or connexionist (PDP) computer models? *Determinism versus Indeterminism in neurology*. The present concept of the brain in neurology. Does it support a deterministic or an indeterministic view that is congruent with our personal and social experience?

Speakers

Prof. Giorgio Innocenti, Department of Neuroscience
Karolinska Institutet, Stockholm, Sweden

Prof. Rasmus Grønfeldt Winther, Philosophy Department
University of California, Santa Cruz, California, USA

Session III: *The Quantum Mind*

The neuronal mind like mirror of the world. In agreement with the role of mirror neurons, how would the mind work and what would be the role of physical and psychological aspects in the mind? Can mirror neurons exist without sensation? Is the (weak) von Neumann/Stapp approach on the convenience of explaining the psyche with the properties of the quantum world acceptable as a possible heuristic means to explain the phenomenological world of the psychic character? *The Hameroff-Penrose hypothesis*. Specific discussion of the Hameroff-Penrose hypothesis within the general framework of the quantum hypothesis.

Speakers

Prof. Stuart Hameroff, Director of Center for Consciousness Studies
University of Arizona, Tucson, Arizona, USA

Dr. Manuel Béjar, Department of Physics
Colegio Nuestra Señora del Recuerdo, Madrid, Spain

Session IV: *The Evolutive Mind*

The human mind is the result of an evolutionary process in which the Darwinist natural selection has been producing the complexity of the brains of superior animals and the human being to select information from the environment, analyze it and construct the necessary responses for optimal survival. The mechanical deterministic rigor and the opening to a world of holistic sensations (perhaps produced by overlapped quantum properties of the matter in the classic systems of the organisms) are selective advantages that have been arising little by little. How we can understand the transit from the animal world to the human world? What is the animal mind and what it is the human mind? Does proto-human conduct exist in the animal world? What is specific of the human mind? Can the theories of Edelman on “remembered present” be applied to explain the origin of the animal and human minds in the memory and the combinatory of images? How to understand the conceptual world of superior animals and to distinguish it from the conceptual world of humans? What is the specific of the human mind? What paper has language had in the animal and human evolution? What is reason?

Speakers

Prof. Ludovico Galleni, Professor of Zoology
University of Pisa, Pisa, Italy

Prof. Anne L.C. Runehov, Department of Theology
University of Copenhagen, Copenhagen, Denmark

Final Debate: *Holistic approach in Biology and Neuroscience*

Moderator of the Seminar:

Quentin Cooper, Science journalist and presenter of “The Material World” and
“Connect” on BBC Radio 4. London, UK

The schedule of the seminar is as follows:

	Monday December 13	Tuesday December 14	Wednesday December 15
9:00-10:15	Session I	Session III	Final Debate
Break			
10:45-13:00			Paella Lunch
16:00-17:15	Session II	Session IV	
Break			
17:45-20:00			