



**POLITECNICO
DI TORINO**



RESEARCH INSTITUTE FOR QUANTITATIVE AND QUANTUM DYNAMICS OF LIVING ORGANISMS
CENTER FOR MEDICINE, MATHEMATICS & PHILOSOPHY STUDIES

COMUNICATO STAMPA

HOW THE THOUGHTS ARE BORN: NEW PERSPECTIVES FROM QUANTUM PHYSICS

Summer School at the Polytechnic of Turin on "Brain and Gut Neuroscience: From Molecules to Mood"

Turin, 24 August 2018 - How is the brain organized from the point of view of the hierarchical structure and how complex is its functioning? What is the mind-brain connection and how are thoughts born? Modern neurosciences propose to answer these questions a multi-scale approach, starting from the molecular aspects and ending with psychological, psychiatric and pharmacological aspects. The "Brain and Gut Neuroscience: From Molecules to Mood" Summer School, organized by the Research Institute for Quantitative and Quantum Dynamics of Living Organisms - Center for Medicine, Mathematics & Philosophy Studies together with Bromatech, Turin Polytechnic, Italian Society of Experimental Biology, intends to present an integrated view of the human brain both in terms of hierarchical structural organization and functional complexity.

The assumptions of cognitive neuroscience employ abstractions from the theoretical constructs of 19th century physics. Specifically, neural network models of "emergent conscious experience" rely on analogies to relations among molecules in crystals, fluids, and gases and employ chemical hypotheses regarding the emergence of thoughts, moods, and perceptions from chemical modulation of synaptic interactions among neurons. However, 20th and 21st century science offers probabilistic perspectives from which to view the mind-brain nexus. Quantum mechanics and quantum field theory have given physicists extra "degrees of freedom". A relatively new offshoot of quantum physics is quantum information theory, quantum cryptography and actual quantum computation which, together with the so-called quantum biology, open the way for new cognitive paradigms and a new psychological literature.

The study of these theories can offer new perspectives for research on the genesis and nature of mental illness.

The course will be hosted by the Polytechnic, from 26 to 31 next and will gather in Turin 50 doctors from all over Italy and about 15 students of technical and physical disciplines, who will discuss with 15 speakers at international level on these topics.