

Scientific Program Committee

Jack Tuszyński, Ph. D.
QPP Scientific Program Committee Chair
Professor of Physics
University of Alberta, Canada
Allard Research Chair
Division of Experimental Oncology
Cross Cancer Institute, Canada

Massimo Cocchi, M. D.
QPP Treasurer
Director, Istituto Paolo Sotgiu
L. U. de S. University, Switzerland
Professor of Nutritional Biochemistry
University of Bologna, Italy

Mansoor Malik, M. D.
QPP Corresponding Secretary
Section Editor for QPP, NeuroQuantology Journal
Associate Professor of Psychiatry
Howard University, USA

Advisory Board

George J. Agich, Ph. D.
Director, BGeXperience Program
Professor of Philosophy
Bowling Green State University, USA

Gustav Bernroider, Ph. D.
Professor of Biology
Neurosignaling Unit
University of Salzburg, Austria

Peter Bruza, Ph. D.
Professor of Information Technology
Queensland University of Technology, Australia

Walter J. Freeman, M. D.
Professor of the Graduate School
Department of Molecular & Cell Biology
Division of Neurobiology
University of California at Berkeley, USA

Fabio Gabrielli, Ph. D.
Dean of the Faculty of Human Sciences
L.U.de.S. University, Switzerland

Gordon Globus, M. D., D. L. F. A. P. A.
Professor Emeritus of Psychiatry
Professor Emeritus of Philosophy
University of California at Irvine, USA

Stuart Hameroff, M. D.
Director, Center for Consciousness Studies
Professor Emeritus of Anesthesiology and Psychology
University of Arizona, USA

Donald Mender, M. D., F. A. P. A.
Lecturer in Psychiatry
Yale University, U. S. A.

Eliano Pessa, Ph. D.
Professor of General Psychology
University of Pavia, Italy

James Phillips, M. D.
Associate Clinical Professor of Psychiatry
Yale University, USA

Massimo Pregolato, Ph. D.
Founder, Quantumbionet
Professor of Medicinal Chemistry
Faculty of Pharmacy
University of Pavia, Italy

Paavo Pykkänen, Ph. D.
University Lecturer in Theoretical Philosophy
University of Helsinki, Finland

John Z. Sadler, M.D.
Co-Editor, Philosophy, Psychiatry, & Psychology Journal
Professor of Psychiatry and Foster Professor of Medical Ethics
University of Texas Southwestern, USA

Henry P. Stapp, Ph. D.
Theoretical Physics Group
Lawrence Berkeley Laboratory, USA

Sultan Tarlaci, M. D.
Editor-in-Chief
NeuroQuantology Journal, Turkey

Lucio Tonello, M.Sc.
Professor of Biomathematical Sciences
L. U. de S. University, Switzerland

Giuseppe Vitiello, Ph. D.
Professor of Physics
University of Salerno, Italy

Ursula Werneke, M. D., M. Sc., M. R. C. Psych
Associate Professor of Psychiatry
Umea University, Sweden

J. Melvin Woody, Ph. D.
Professor of Philosophy
Connecticut College, USA

Nancy J. Woolf, Ph. D.
Professor of Psychology and Behavioral Neuroscience
University of California at Los Angeles, USA

Paola Zizzi, Ph. D.
Istituto Paolo Sotgiu
L. U. de S. University, Switzerland



qpp

quantum paradigms of psychopathology a global scientific initiative

On this day of June 20, 2014 a core international group of investigators (Bernroider, Cocchi, Gabrielli, Globus, Malik, Mender, Mullis, Pessa, Pregolato, Pykkänen, Rasenick, Tonello, Tuszyński, Vitiello, Werneke, Zizzi), with expertise in the fields of psychiatry, biochemistry, physics, computational neuroscience, mathematics, philosophy and theology, gathered in Bologna, Emilia Romagna, to assess the potential relevance of quantum and quantitative aspects in augmenting the knowledge and understanding of mind-brain relations in psychopathologic conditions applicable to humans.

In the light of diagnostic possibilities that these disciplines will give to the subjectivity of the psychiatric interpretation, it seems inevitable the rise of ethics aspects.

On this day of June 20, 2014 a core international group of investigators (Bernroider, Cocchi, Gabrielli, Globus, Malik, Mender, Mullis, Pessa, Pregolato, Pykkänen, Rasenick, Tonello, Tuszyński, Vitiello, Werneke, Zizzi), with expertise in the fields of psychiatry, biochemistry, physics, computational neuroscience, mathematics, philosophy and theology, gathered in Bologna, Emilia Romagna, to assess the potential relevance of quantum and quantitative aspects in augmenting the knowledge and understanding of mind-brain relations in psychopathologic conditions applicable to humans.

In the light of diagnostic possibilities that these disciplines will give to the subjectivity of the psychiatric interpretation, it seems inevitable the rise of ethics aspects.

It can be stated that

So far no explanatory bridge between consciousness and corporeal neural tissue has issued from the classical biophysics of mind and brain in homo sapiens, and, in research on non-human subjects precluding self-reports via human language abilities, even correlations have remained substantially elusive. Quantum approaches may offer greater latitude in addressing these classical deficiencies, to the extent that at least some latent links formally exist between the qualitative dimensionality and quantitative measurability of canonically conjugate quantum observables, whereas no such formal links are required with reference to the possessed observables of classical physics. Moreover, at least one interpretation of quantum measurement as formulated by John Von Neumann casts the measuring agency itself as subjectively conscious per se, in contrast to an absence of any such classical notion.

Quantum generalization of classical biophysics opens up the possibility that relevant brain processes may reach both beneath the scale and beyond the boundaries of discrete neurons and the synaptic connections among those classically cellular “nodes.” Quantum-germane structures and dynamics within the brain may include superposed dimeric tubulin conformations in the microtubular cytoskeleton spanning both intraneuronal and interneuronal spaces, ordered water in relation to cytoskeletal proteins, membrane channels and lipids along with their second messenger pipe lines to neuronal interstices, and solitons communicating along cytoskeletal routes between classical and quantum aspects of brain function. Max Tegmark’s objections to the thermodynamic feasibility of such quantum structures and processes surviving thermal decoherence at biological temperatures entailing orders of magnitude comparable to those within the human skull have been thrown into doubt by the recent work of Gregory Engel’s group, which demonstrated non-trivial quantum computation in photosynthesis. The ubiquity of water, cytoskeletal tubulin, membrane lipids, and second messengers in non-human life suggests that a new biophysics accounting for quantum-generalized processes in living tissue may lead to future predictions about consciousness not only in human beings but also in organisms lacking any semblance of human brain architecture at the level of organized neuronal networks or “higher.”

Emmanuel Pothos and Jerome Busemeyer have presented abundant empirical evidence that properties of normal mental life may be more parsimoniously modeled by abstract quantum formalisms than by classical computational algorithms. The quantum wetware outlined above is more compatible with these formalistic findings than is any classical model of neural biophysics. Both quantum-logical and quantum-physical approaches to mind and brain also promise to generate avenues for better comprehension of neurophysics in psychopathology. Explanatory and even psychotherapeutic opportunities may emerge from considerations of superpositional logic and malattunement in the primary process thinking of schizophrenia, Everett’s quantum ontology in the “alternate worlds” of psychotic perception, and membrane and second-messenger interfaces between serotonin biochemistry and quantum-microtubular nanowire dysfunction in mood disorders. Aberrations of scale emergence in quantum thermofield phase transitions and problematic barriers to Bohmian holism may be important in multiple forms of mental illness.