



UNIVERSITY OF MIAMI
COLLEGE of
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Affiliation: Virginia Tech University

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The Weight of the Quantum

Abstract

2025 has been designated by the United Nations as the International Year

of Quantum Science and Technology in honor of the 100th anniversary of quantum mechanics. In this talk I will reflect on quantum theory and its central importance for the overall structure of physics. After discussing the spacetime and quantum aspects of that structure, I will address the apparently irreconcilable conflict between the two and the resolution of that conflict through the new concept of gravitization of quantum theory. This offers a novel view of quantum foundations, such as

the nature of measurement in quantum physics, as well as the meaning of

quantum probabilities and the Born rule. Furthermore, gravitization of quantum theory sheds new light on the problem of quantum gravity and quantum spacetime, the foundations of string theory, the cosmological constant problem, the masses of elementary particles, as well as the puzzles of dark energy and dark matter. Perhaps the most exciting aspect of this approach is the manageable experimental probe of gravitized quantum theory via the search for intrinsic triple and higher order quantum interference, forbidden by the Born rule. This talk is based on a popular book "The Weight

of the Quantum: Quantum Theory and the Structure of Physics" written in collaboration with Tristan Hubsch.