



ICFO Colloquium RENATO RENNER 'Wigner's Friends Disagree: a Thought Experiment to Question the Foundations of Quantum Theory'

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Friday, October 7, 12:00, ICFO Auditorium

RENATO RENNER

Professor for Theoretical Physics, Head of the Quantum Information Theory group, The Institute for Theoretical Physics, ETH Zurich. Renato Renner studied physics, first at EPF Lausanne and later at ETH Zurich, where he graduated in theoretical physics. He then moved to the Computer Science Department to work on a thesis in the area of quantum cryptography. After getting his PhD degree, he spent two years in the UK, where he was a HP research fellow in the Department for Applied Mathematics and Theoretical Physics at the University of Cambridge.

In 2007 he started as an Assistant Professor at ETH Zurich. He was promoted in 2012 to an Associate Professor and in 2015 to a Full Professor. His research interests are in the area of Quantum Information Science, Quantum Thermodynamics, and the Foundations of Quantum Physics.

Information theory, apart from its many technological implications, also provides a novel view on the foundations of quantum mechanics. In this talk I will present a thought experiment motivated by information theory. The idea is to consider the consistency between the predictions made by different agents, who have access to different pieces of information. Specifically, we let one agent (Wigner) use quantum theory to reason about the predictions that other agents (his friends) arrive at using quantum theory. Under the assumption that measurements have single outcomes (from the viewpoint of the agent who performs the measurement) this reasoning leads to a logical contradiction. This shows that many standard interpretations of quantum theory are not self-consistent.

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