

The **Vienna Center for Quantum Science and Technology (VCQ)**  
invites you to a

## COLLOQUIUM TALK

by

**Rob Spekkens**

(Perimeter Institute)

### ***Why interference phenomena do not capture the essence of quantum theory?***

Quantum interference phenomena are widely viewed as posing a challenge to the classical worldview. Feynman even went so far as to claim that they are the *only mystery* and the *basic peculiarity* of quantum mechanics. We challenge this claim by describing an alternative to quantum theory, a statistical theory of a classical discrete field—a ‘toy field theory’—that reproduces the relevant phenomenology of quantum interference while respecting the classical worldview in the sense of being realizable by a local and noncontextual ontological model. This theory also reproduces a number of related interference phenomena, such as the Elitzur-Vaidman bomb tester, Wheeler’s delayed-choice experiment, and the quantum eraser experiment. Finally, we identify an aspect of interference phenomenology that *does* resist explanation within the classical worldview, namely, the functional form of the quantum wave-particle duality relation.

**Monday, 21<sup>st</sup> November 2022,**  
**17:00 get-together with coffee and snacks!**

Lise-Meitner Lecture Hall, Boltzmannngasse 5, 1090 Vienna

The seminar talk will be preceded by a VCQ Student talk at 17:30 by

**Stefan Ludescher**  
(IQOQI Vienna)

***"Entanglement/Asymmetry correspondence for internal quantum reference frames"***

**Host: Markus Müller**