Abstract Submitted
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Quantum Bayesian Coherence[1] CHRISTOPHER FUCHS, Perimeter Institute for Theoretical Physics — In the quantum-Bayesian development of quantum theory the Born Rule cannot be interpreted as a rule for setting measurement-outcome probabilities from an objective quantum state. But if not, what is the role of the rule? In this talk, we argue that it should be seen as an empirical addition to Bayesian reasoning itself. Particularly, we show how to view the Born Rule as a normative rule in addition to usual Dutch-book coherence. It is a rule that takes into account how one should assign probabilities to the consequences of various intended measurements on a physical system, but explicitly in terms of prior probabilities for and conditional probabilities consequent upon the imagined outcomes of a special counterfactual reference measurement. This interpretation is seen particularly clearly by representing quantum states in terms of probabilities for the outcomes of a fixed, fiducial symmetric informationally complete (SIC) measurement. We further explore the extent to which the general form of the new normative rule implies the full state-space structure of quantum mechanics. It seems to get quite far.

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Christopher Fuchs
Perimeter Institute for Theoretical Physics

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