Weststeijn, Nikki

Wigner’s friend and relational quantum mechanics: a reply to Laudisa. (English)

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Summary: Relational Quantum Mechanics is an interpretation of quantum mechanics proposed by Carlo Rovelli. Rovelli argues that, in the same spirit as Einstein’s theory of relativity, physical quantities can only have definite values relative to an observer. Relational Quantum Mechanics is hereby able to offer a principled explanation of the problem of nested measurement, also known as Wigner’s friend. Since quantum states are taken to be relative states that depend on both the system and the observer, there is no inconsistency in the descriptions of the observers. Federico Laudisa has recently argued, however, that Rovelli’s description of Wigner’s friend is ambiguous, because it does not take into account the correlation between the observer and the quantum system. He argues that if this correlation is taken into account, the problem with Wigner’s friend disappears and, therefore, a relativization of quantum states is not necessary. I will show that Laudisa’s criticism is not justified. To the extent that the correlation can be accurately reflected, the problem of Wigner’s friend remains. An interpretation of quantum mechanics that provides a solution to it, like Relational Quantum Mechanics, is therefore a welcome one.

MSC:

81Pxx Foundations, quantum information and its processing, quantum axioms, and philosophy
94Axx Communication, information
94-XX Information and communication theory, circuits

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relational quantum mechanics; Wigner’s friend; third person problem; measurement problem

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References:


