

ABSTRACT

The metaphysics of Rovelli's relational interpretation of quantum mechanics

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Rather than assigning an ontological meaning to the wave function, Carlo Rovelli's (programmatically antimetaphysical) relational interpretation of QM focuses on the sequence of actual measurement outcomes q_1, q_2, q_n . Such outcomes constitute the events of spacetime, and are to be regarded as the result of *correlations* of quantum systems with particular "observing physical systems" S ; no meaning is attached to the intrinsic properties of an isolated quantum system Q .¹ A quantum system Q can be said to possess a certain property q only relative to a *system* S ; relative to another observing system S' , Q and S may be in an indefinite state, i.e., in a superposition. Relational quantum mechanics is therefore a way of reconciling the universality of application of the principle of quantum superposition with the fact that the observed world is characterized by uniquely determined events (Rovelli 1996, Bitbol 2007).

In my talk I will analyze Rovelli's relationism in view of the following three problems: 1) is it reasonable to interpret the quantum state (as Rovelli has it) as a disposition to display certain values in correlations with macroscopic physical systems? 2) more in general – and to the extent that Rovelli's interpretation is a subspecies of an Everettian approach to quantum mechanics² – does the latter need genuine dispositions in order to account either for branching or for time-asymmetric decoherence? 3) in Rovelli's interpretation, is the quantum universe the only non-relational entity?

References

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¹ «The unique account of the state of the world of the classical theory is thus fractured into a multiplicity of accounts, one for each possible "observing" physical system.» (Rovelli and Laudisa 2008, sect. 2).

² This is rather controversial, but for the sake of the argument I will pretend that it belongs to the species