TRATTENBACH-JILSKÁ

Sdružení absolventů a přátel Grundschule Trattenbach

& Oddělení analytické filosofie Filosofického ústavu AV ČR

uvádějí/present

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SPACE QUANTUM REALISM AT STAKE: A BOHMIAN STRUCTURAL APPROACH

There is a broad discussion in the philosophy of physics literature concerning the preference towards one among different realistic interpretations of quantum theory. On the basis of certain realist desiderata, this discussion has been recently addressed in the context of the choice between different opposite views about the real and fundamental space in which the ontology of this theory lives: on the one hand, quantum realists claim that it lives in a real and fundamental high-dimensional space; on the other hand, they have assumed that the ontology lives in the three-dimensional space of our everyday experience instead. In this talk, I will critically evaluate the tenability of the low/high dimensional space distinction in the context of one particular interpretation of quantum theory: Bohmian mechanics. To do so, I will be following two philosophical and physical strategies: first, I will undermine the assumption that a set of epistemic criteria, presumed to block the threat on the rationality of theory choice, can solve the underdetermination problem associated with the reality and fundamentality of the space in which the Bohmian ontology lives; and secondly, I will suggest a structural Bohmian interpretation through the use of symmetry principles, according to which the low/high-dimensional space distinction is just apparent as both spaces actually form part of the same structure.

Thursday, March 11, 2021, 3PM

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