Mathematical Physics

Review of the Topos Approach to Quantum Theory

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Topos theory has been suggested by D\"oring and Isham as an alternative mathematical structure with which to formulate physical theories. In particular, the topos approach suggests a radical new way of thinking about what a theory of physics is and what its conceptual framework looks like. The motivation of using topos theory to express quantum theory lies in the desire to overcome certain interpretational problems inherent in the standard formulation of the theory. In particular, the topos reformulation of quantum theory overcomes the instrumentalist/Copenhagen interpretation thereby rendering the theory more realist. In the process one ends up with a multivalued/intuitionistic logic rather than a Boolean logic. In this article we shall review some of these developments.

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