

SCIENTIFIC REALISM IN THE AGE OF STRING THEORY

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Abstract

String theory currently is the only viable candidate for a unified description of all known natural forces. This article tries to demonstrate that the fundamental structural and methodological differences that set string theory apart from other physical theories have important philosophical consequences. Focussing on implications for the realism debate in philosophy of science, it is argued that both poles of that debate face new problems in the context of string theory. On the one hand, the claim of underdetermination of scientific theory by the available empirical data, which is a pivotal element of empiricism, loses much of its plausibility. On the other hand, the dissolution of any meaningful notion of an external ontological object destroys the basis for conventional versions of scientific realism. String theory seems to suggest an intermediate position akin to Structural Realism that is based on a newly emerging principle, to be called the principle of theoretical uniqueness.

Keywords: realism, underdetermination, string theory, structural realism, particle physics

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