

# Holism and Structuralism in Classical and Quantum General Relativity

Dorato, Mauro and Pauri, Massimo (2004) Holism and Structuralism in Classical and Quantum General Relativity.

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## Abstract

The main aim of our paper is to show that interpretative issues belonging to classical General Relativity (GR) might be preliminary to a deeper understanding of conceptual problems stemming from on-going attempts at constructing a quantum theory of gravity. Among such interpretative issues, we focus on the meaning of general covariance and the related question of the identity of points, by basing our investigation on the Hamiltonian formulation of GR. In particular, we argue that the adoption of a peculiar gauge-fixing within the canonical reduction of ADM metric gravity may yield a new solution to the debate between substantivalists and relationists, by suggesting a *tertium quid* between these two age-old positions. Such a third position enables us to evaluate the controversial relationship between entity realism and structural realism in a well-defined case study. After having indicated the possible developments of this approach in Quantum Gravity, we discuss the structuralist and holistic features of the class of spacetime models that are used in the above mentioned canonical reduction.

**Keywords:** Structuralism, Holism, Spacetime, Dirac Observables

**Subjects:** [Specific Sciences: Physics: Relativity Theory](#)  
[General Issues: Realism/Anti-realism](#)

**ID Code:** 1606

**Deposited By:** [Pauri, Massimo](#)

**Deposited On:** 10 February 2004