

AGPhil 12: The Problem of Time

Time: Friday 15:30–16:45

Location: A 060

Invited Talk

AGPhil 12.1 Fri 15:30 A 060

The Hole Argument and the Problem of Time — ●KARIM THEBAULT — Munich Center for Mathematical Philosophy, LMU Munich

The canonical formalism of general relativity affords a particularly interesting characterisation of the infamous hole argument. It also provides a natural formalism in which to relate the hole argument to the problem of time in classical and quantum gravity. In this talk I will examine the connection between these two key problems in the foundations of spacetime theory along a number of interrelated lines. First, from a formal perspective, I will consider the extent to which the two problems can and cannot be precisely and distinctly characterised in classical and quantum canonical gravity. Second, from a philosophical perspective, I will consider the ontological implications of various responses to the problems, with a particular focus upon the relationalist/substantialist debate. Third, from a methodological perspective, I will consider why the respective importance of the problems is differently evaluated by physicists and philosophers. My conclusions shall constitute a call to arms: important issues remain regarding the hole argument and the problem of time; these issues relate to conceptual and formal inadequacies within the representative language of canonical gravity; collaborative work to resolve these inadequacies will be of mutual benefit to both physicists and philosophers.

AGPhil 12.2 Fri 16:15 A 060

The Grammar of the Problem of Time — ●NEIL DEWAR — University of Oxford, Oxford, UK

In this paper, I will argue that the problem of time in General Relativity is best understood as a kind of grammatical mistake; by doing so, we are able to assimilate the problem of time to analogous issues in the philosophy of language. Linguistic acts of description involve two components: the use of language to refer to some particular part of the world, followed by its use to predicate certain qualities or attributes of that part. The Hamiltonian formalism draws an analogous distinction between time variables (serving the referential function) and other variables (serving the predicative function), but this distinction is ignored by the Dirac reduction procedure. Hence, the problem of time is, at heart, a problem about how the referential use of language achieves its function, and how it interacts with the predicative use of language. I therefore look at how various programs for solving or dissolving the problem of time relate to philosophical treatments of this issue. This approach has the virtue of making the purely conceptual issues a little more perspicuous, as we can separate them from mathematical complications. I conclude, therefore, with some lessons that can be imported from the philosophy to the physics.