AGPhil 10: The role of the present in spacetime theories

Time: Friday 11:15–12:45 Location: A 060

AGPhil 10.1 Fri 11:15 A 060

Trajectory, Eigenzeit and Lapse of Time — •Thorben Petersen — Department of Philosophy, University of Bremen

Ever since its discovery, the theory of relativity has intrigued philosophers because of its implications for the metaphysics of time and, in particular, as regards the question whether time does pass. The goal is to develop a conception of the so-called passage or lapse of time, which is (i) properly relativistic (i.e. which takes spacetime to be a four-dimensional entity and acknowledges the relativity of simultaneity) but (ii) does not fall back on the counterintuitive though prevalent idea that this phenomenon is an illusion or mere construction of our minds. In this talk, I show that these criteria can be met if we accept that the lapse of time is grounded, locally, in how the development of integral wholes (such as an organism) is represented. To this end, I draw attention to the (usually overlooked) notion of parameter time. In particular, I argue that integral wholes follow trajectories in spacetime, which can be operationalized by co-moving clocks, measuring the Eigenzeit of these trajectories. To say that a certain integral whole develops, then, is to say that the whole is located, at different moments of its Eigenzeit, at different points (or parts) of its trajectory.

AGPhil 10.2 Fri 11:45 A 060

Physics and The End of Time — •yuval dolev — Bar Ilan University, Ramat Gan, Israel

Contrary to the received view, I will argue that, not only can relativity theory, both special and general, accommodate a global present, it in fact must do so. I will present this claim in the context of a broader assessment of the manners in which relativity has revolutionized our understanding of time and the degree to which is has done so. I will distinguish between "technological" and "philosophical" lessons we learn from the theory, and argue that while the former are momentous, the later have been exaggerated. Specifically, tense and passage, supposedly ousted by the theory, remain crucial and irremovable in our conception of reality itself, and not merely as aspects of how we apprehend it. I will discuss recent attempts to make this claim from within physics, focusing on Smolin's Time Reborn, and evaluate their merits, weaknesses, and effectiveness. My conclusion will be a reconfirmation of Einstein's own view that there's no room for a Now in physics, and hence no way to retrieve tense from within physics. But rather than deducing, like Einstein, the illusoriness of tense and passage, I will suggest that a real Now is compatible with physics, and actually plays a vital role in the experience of physicists, a role without which physics itself would be unimaginable.

AGPhil 10.3 Fri 12:15 A 060

Social particles. On the common roots of aggression, altruism, co-operation and grouping — •Karl Theodor Kalveram — Tu Darmstadt and Uni Duesseldorf

We are accustomed of the strange outcome of the interaction of particles: particles that annihilate if meeting each other and re-emerge from vacuum. Some attract and some refute others. Their demeanor, however, is, temporal stationarity presumed, only describable statistically, and governed by equations proposed by Schroedinger or Heisenberg. Now we look at another type of particles interacting, too, with randomly varying outcomes. Their properties, however, can change over time, some rules of which being formulated first by Darwin. Here I present a mathematical formalism describing behavior and evolution of a selection called 'social particles'.

The formalism considers population dynamics as dependent on the particles' average birth and death rate, the average outcome of social interactions as influencing this ratio, and the reproduction ratio (birth rate/death rate) as fitness. A special 'gene setting' passed to offspring determines a particle's behavior in encounters. Following Dawkins, particles sharing the same gene setting (here called gene-relatives) should favor each other or exempt from harm in an encounter, but type one and type two errors hamper a correct behavioural decision. Inserting pay-off matrices characterizing aggression, altruism, co-operation or grouping into the formalism reveals, how the respective social particles' frequency develops in domains with limited resources.